

In This Issue—*Taking the Guess Out of Service*

MOTOR AGE

Vol. XLV
Number 3

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CHICAGO, JANUARY 17, 1924

Thirty-five Cents a Copy
Three Dollars a Year

The New ESSEX A SIX

Built by Hudson under Hudson Patents

Largest Sales in Our History

From the first day the new Essex has been the most sensational seller ever brought out by Essex. The production schedule is vastly enlarged—it makes Essex one of the world's largest production cars.

It offers the most outstanding opportunity for new dealers in the motor industry.

In all advantages of dealer and owner appeal the new Essex surpasses even the former products by which the notable prosperity of Hudson and Essex dealers was built.

With the new Essex Coach you sell the lowest priced, six-cylinder, 5-passenger, closed car on the market—with this price is an even more attractive coach body and a 6-cylinder motor built on the principle of the famous Super-Six. A ride will convince any dealer, just as the same test is winning buyers.

Only two models to handle—the coach and the touring car. No slow turning models to tie up capital. A service policy equally advantageous to dealer and buyer will interest you as the most satisfactory arrangement offered by any motor company.

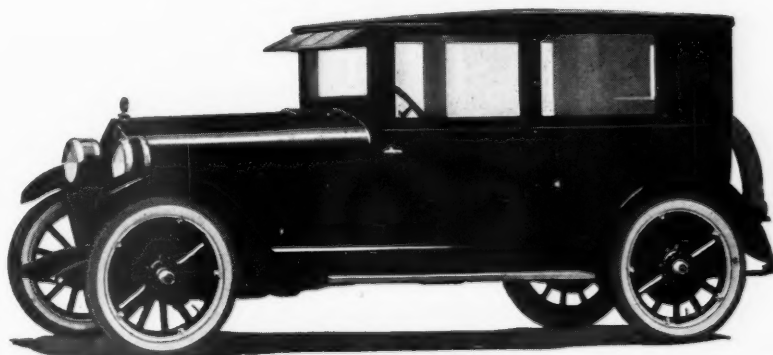
A finance plan will assist you in that important end of your business.

Act now—See the New Essex. Try it. Compare it with any value on the market. If you want to sell it write or wire at once.

**The
Coach
\$975**

Touring Model - \$850
Freight and Tax Extra

ESSEX MOTORS
DETROIT, MICHIGAN



PREVENTABLE TROUBLES—No. 4—FOUL SPARK PLUGS

Does the Piston Ring You Use *Cause* or *Prevent* Them?



"You said it, Mr. Gallagher, how *could* you get a spark from that plug."
"That beats the Dutch!—I scoured 'em all only yesterday afternoon."
"Yes, but you can't scour leaky piston rings—*that's* where your trouble comes from."

NO-LEAK-O

Piston Rings

Made in one piece, easy to install, quick seating, of finest material, guaranteed against breakage and individually tested for accuracy. Brinell tested for correct hardness. Give equal tension on the cylinder walls. The leading replacement ring. Over 200 reliable jobbers carry No-Leak-O in standard sizes and over sizes.

35c
and up

Important: In buying Piston Rings insist on the genuine No-Leak-O with the original "oilSEALing" groove, packed in the standard package bearing the famous ring and seal, our registered trademark. Beware of imitations.

Building a good solid repair shop business asks one big thing for its foundation—CONFIDENCE. When you've got that, you've got everything. You hold your old customers and attract new ones of the same type. Thoroughness, a persevering effort to get a job done (that is, done so that it'll *stay* done) and the use of the best replacement materials—these three things will win SHOP PROFITS always. On piston ring jobs there's nothing so confidence-building as No-Leak-O.

No-Leak-Os "won't leak because they're sealed with oil." A specially cut groove—the "oilSEALing" groove—found only in No-Leak-O Piston Rings—packs an oil film in between your piston and cylinder walls like "packing" in a pump. This oil "packing" seals in all the expanding gas. Every drop must work. By simply reversing the top ring, no unburnt gas or coal oil can seep down into the crank case to thin out lubrication. In this way No-Leak-O prevents 75% of all motor troubles. No-Leak-Os hold your customers because they make the right repair job, use less oil, less gas and give more Power.

Write for valuable booklet, "How to Fit Piston Rings."
Also let us tell you how our liberal dealer proposition can increase your profits.

One Price during eight years of continued success.
One design—for all cars—35c and up.

NO-LEAK-O PISTON RING COMPANY

Dept. 181

Muskegon, Michigan

WON'T LEAK

because they're sealed with Oil

1200 Dealers
selling other cars want
the New

MOON

\$995 Six

The first distinctive high-grade six to sell for less than a thousand dollars!

The interest in Moon cars, and in the liberal Moon franchise and financial co-operation, is now greater than it has ever been! 1,200 dealers selling other cars want the New Moon Six!

Shown for the first time at the New York Automobile Show. Even before seeing the car, and with but a meager description of it, hundreds of dealers wrote for the Moon franchise! They knew that a six-cylinder car at \$995, with Moon's outstanding characteristics, would be a big sales producer in 1924!

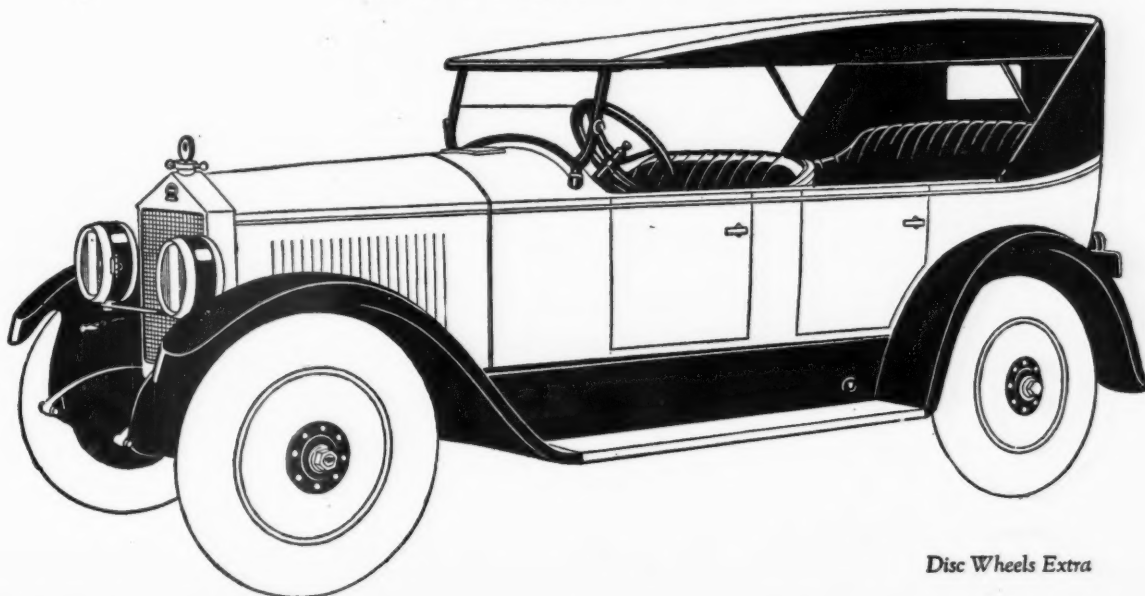
Distinctly a Moon! Moon mechanical excellence throughout! Famous proven units, of course: Special Moon Continental motor. Delco starting, lighting and ignition. Warner transmission.

Ross steering gear. Borg & Beck clutch. Timken axles and bearings!

A powerful man-size six! Sweeping sport contour! Familiar Moon silver radiator! Roomy 5-passenger capacity. Genuine leather upholstery! Cord tires! Two-piece windshield. Cowl ventilator! Think of a car like this selling for only \$995! The lowest price at which a Moon has ever sold. A car people will want—and buy! It completely rounds out the Moon line. Enables you to meet all competition. A big opportunity awaits live dealers! Get the details of the New Moon Six, and the Moon franchise, at once!

The complete Moon line now offers a wide range of open and enclosed models, priced upward from \$995. Three series in addition to the new popular-priced six: the Six-40; Six-50; and Six-58.

Built by MOON MOTOR CAR COMPANY, St. Louis, U. S. A.
Stewart McDonald, President



Disc Wheels Extra

Moon Has Adopted Lockheed 4-Wheel Hydraulic Brakes! Optional on All Models at Additional Cost

Trademarked
Carton of
Ten Springs



Each Spring
Plainly Marked
"Bendix"

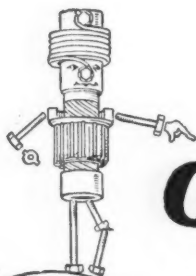
A Handy, Profitable Box

HERE they are—genuine springs for the Bendix Drive—handy, convenient and profitable. Note, please, that each spring is plainly labeled, so that your customer will KNOW that it is a GENUINE spring.

These genuine springs come in handy cartons of ten each. They are offered in assorted sizes, or will be supplied all of one type, at your option. Easy to stock, easy to handle, easy to identify—and quick to sell.

In our experience none but a GENUINE part will give our standard of satisfactory, dependable service in the Bendix Drive.

CAUTION: In our Bendix Drive advertisements, now appearing regularly each month in The Saturday Evening Post and The Literary Digest, the public is being cautioned to buy none but genuine parts and is asked to look for the name "Bendix" on each part.

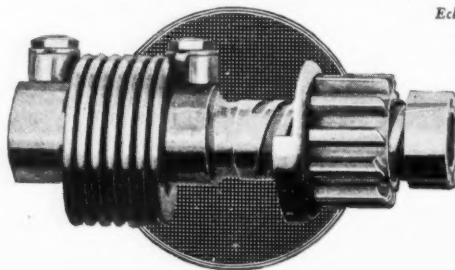


It pays to sell none but
GENUINE PARTS
FOR
BENDIX
DRIVE

ECLIPSE MACHINE CO., ELMIRA, NEW YORK

Detroit Office
1342 Book Bldg.

Eclipse Machine Co., Limited
Walkerville, Ontario



MOTOR AGE

Reg. U. S. Pat. Off.

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SUBSCRIPTION RATES

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|--------------------------------------------------|------------------|
| United States, Mexico and U. S. Possessions..... | \$ 3.00 per year |
| Canada | 5.00 per year |
| All Other Countries in Postal Union..... | 6.00 per year |
| Single Copies | 35 cents |

Subscriptions accepted only from the Automotive Trade

Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.

SILVERTOWNS—

*Plus the Best Contract
the Dealer ever saw*

IT profits any dealer to be known as a Silvertown Dealer. To sell the tire of supreme quality, is a fine foundation for prosperity. The very name *Silvertown* carries with it a unique distinction among car owners. Silvertown singles out a dealer and his business.

But Silvertown is only one item of the Goodrich 1924 Proposition. The foundation of the contract, is a universal price to one and all contract dealers, backed by liberal dating during the winter, and complete price protection. A contract dealer knows that Goodrich gives him the best prices quoted anybody and nobody can purchase Goodrich Tires for less.

With Silvertown, the oldest and best-known tire, at record low prices—Commander Cord, challenger of low price competition—and Goodrich "55," a bottom-price, quality fabric,—a dealer baffles competition.

Don't sign any contract until you know *personally* what Goodrich has for you. Write the nearest Goodrich Branch for full particulars.

THE B. F. GOODRICH RUBBER COMPANY

ESTABLISHED 1870

Goodrich

TIRES

"Best in the Long Run"



A grade

for each requirement

and each grade is uniform in quality. Durability, Adhesiveness and Yardage are the principal requirements to look for when buying tape. Westinghouse Tapes have all these features in addition to many others, which assure perfect results for both electrical and mechanical protection, the two most important functions of Friction Tapes.

Don't be satisfied with merely tape—specify Westinghouse Tapes. A grade for each requirement.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Adhere Friction Tape—
For general requirements.

IXL Friction Tape—
For motor or generator work and interior wiring. Has extremely high yardage.

Westinghouse Friction Tape, Straight and Bias—
For all service where highest quality is required.

Westinghouse Special Splicing Compound—
For all service where best rubber tape is required.

Pittsburgh Splicing Compound—
For general use where service conditions are not severe or where a low-priced rubber tape is desired.

Armature Tape—
A high grade, light tape, frictioned on one side only, for insulation on armature coils.



Who Gets the Repeat Business?

Thousands of dealers have spent their money in starting families in on their first automobiles only to pass the repeat business along to a competitor.

Repeat sales are the easiest to make—when you have a complete line of cars—and the dealer who must refer these buyers to his neighbor because he does not have a car of the right size, style and price, is working under a handicap.

The Studebaker dealer, selling three chassis models with thirteen body types, appeals to the whole quality market and is able to keep his customers year after year.

He can sell a prospect a Light-Six and then as his buying-power—or his family increases, a Special-Six, and finally a Big-Six. And the Big-Six is as fine a car as he can obtain or will ever want—so he's satisfied to remain a Big-Six owner for life.

The completeness of the Studebaker line and the uniform high quality of Studebaker cars are vital reasons for the success of Studebaker dealers.

An inquiry will bring further information about the most attractive proposition in the industry.

| 1924 MODELS AND PRICES—f. o. b. factory | | | | | |
|--------------------------------------------|-------|----------------------------------------------|--------|------------------------------------------|--------|
| LIGHT-SIX 5-Pass., 112" W. B., 40 H. P. | | SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P. | | BIG-SIX 7-Pass., 126" W. B., 60 H. P. | |
| Touring..... | \$995 | Touring..... | \$1350 | Touring..... | \$1750 |
| Roadster (3-Pass.)..... | 975 | Roadster (2-Pass.)..... | 1325 | Speedster (5-Pass.)..... | 1835 |
| Coupe-Roadster (2-Pass.)..... | 1195 | Coupe (5-Pass.)..... | 1895 | Coupe (5-Pass.)..... | 2495 |
| Coupe (5-Pass.)..... | 1395 | Sedan..... | 1985 | Sedan..... | 2685 |
| Sedan..... | 1485 | | | | |

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

STUDEBAKER



T H I S I S A S T U D E B A K E R Y E A R

Metallurgy *Is As Important As Design*

BOTH must be right in a successful product. Design is responsible for proper size, form, and relation of one part to another.

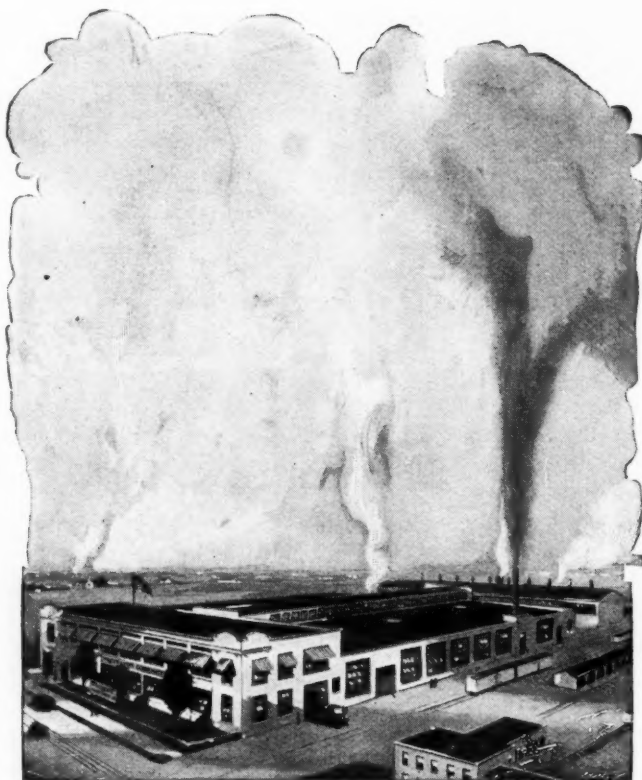
Metallurgy is responsible for the proper handling of stress and strain and, in the case of bearings, for the reduction of friction, full transmission of power and long life.

Mogul bearings are metallurgically right—made so by complete handling in our own plant from virgin metals to the finished product.

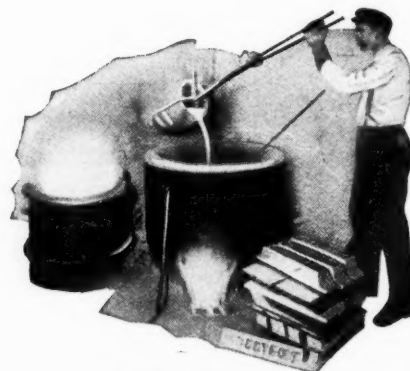
MUZZY-LYON COMPANY
DETROIT MICHIGAN

Mogul

Engine Bearings and Bearing Alloys



In this fine plant, Mogul bearings, bushings and bearing alloys are produced. In it is every facility for economical, accurate, large scale production. Mogul products include Die Cast Babbitt Bearings and Bushings, Bronze Back Babbitt Lined Bearings, Babbitt Cored Bars, Babbitt Metal.



Blending Mogul Alloys
in our own foundry.



OLDSMOBILE SIX is a Fast Seller With a Big Future

WE don't have to tell you that business is good with the Oldsmobile Six—the gossip of the trade tells you that. But maybe you haven't considered *why* Oldsmobile is a fast seller and *what* insures it a big future. The reasons are:

It is the lowest priced Oldsmobile since the "curved dash" model of twenty-five years ago.

It is a "Six" at \$750. People like sixes,—and here is a six at a low four-cylinder price.

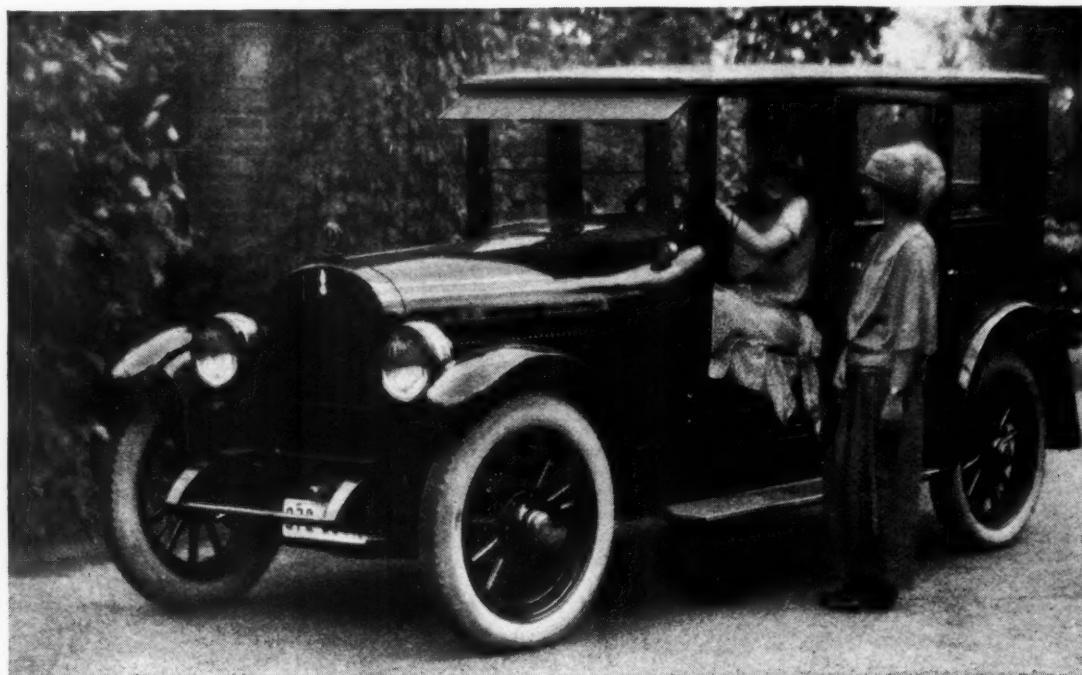
It is a Product of General Motors—which guarantees highest value and a strong, permanent company back of the car.

OLDS MOTOR WORKS, LANSING, MICHIGAN
Olds Motor Works of Canada, Ltd., Oshawa, Ont.

OLDSMOBILE SIX

PRODUCT OF GENERAL MOTORS

*Have you
applied for
territory?*



Has an Arbitrary Policy Destroyed Your "Quality" Market?

MANY dealers have been forced to give up their "quality" market to concentrate on single lines selling under \$1500. After devoting years of effort to develop a "quality" market, it is disappointing to find yourself limited to cars which fail to interest those better prospects you worked so hard to get.

What would you think of a furniture dealer who tried to sell you a \$150 dining-room set and then sent you across the street when he learned you wanted a \$500 set?

Contrast your present situation with that of other dealers who are selling Case motor cars in conjunction with a lower-priced line. The Case line—two models in seven body

types—is giving these dealers a very definite standard of value to offer their "quality" clientele. Case cars, added to their other line enables them to cover the entire buying market. They have a car to fit every buyer. This means more profit for them.

If you have determined not to permit your prize customers to slip away to the other fellow across the street—if you really desire to have your profits climb to their former normal, you're going to wire, write or come to us for complete information on the Case dealer's agreement. No other franchise, available today, offers you a better opportunity of retrieving your present disrupted "quality" market.

J. I. CASE T. M. COMPANY, RACINE, WISCONSIN



CASE

MOTOR CARS



THE SIGN OF MECHANICAL EXCELLENCE

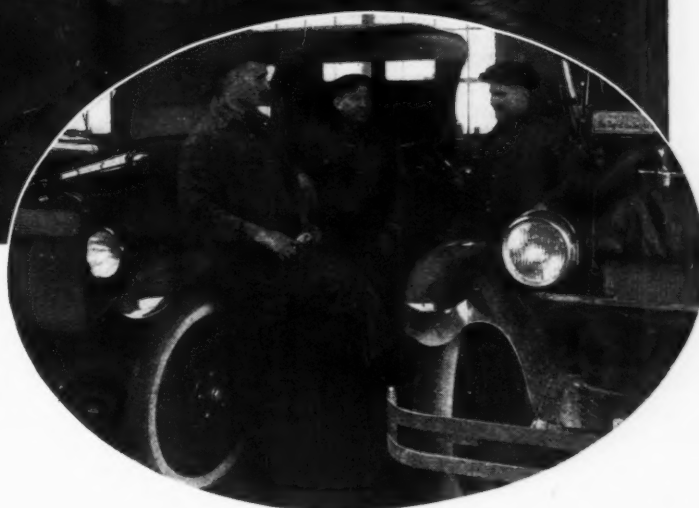


FOR MORE THAN EIGHTY YEARS

MOTOR AGE



Every mechanic wants to make more money and more money for him means more money for the dealer. The mechanics shown in the top illustration are working on the piece work plan as used by all the community dealers of the Overland Wisconsin Co. The more work they do the more pay they get and the better the service rendered. The story in the oval is the familiar one of mechanics working on the so much per hour basis



Taking the Guess Out of Service

The Overland Wisconsin Co. of Milwaukee Uses a Plan Whereby It Agrees to Keep Up Its Cars Over a Period of One Year at a Definite Cost to the Car Owner of 7 Cents a Day

By B. M. IKERT

THE Overland-Wisconsin Co. of Milwaukee long since has taken the guess out of service.

This company makes it possible for a person to buy a car and know exactly how much it will cost to keep that car in proper running condition.

In fact, so sure is this company of the ground upon which it stands that it guarantees to keep any new Overland car or commercial car in proper running condition including labor and parts—excepting only tires, batteries and speedometers, and damage from wrecks or

collisions—for an entire year at a cost of only 7 cents per day.

This plan has been made possible largely through an analysis of the performance records of Overland cars in this territory. Thousands of service and repair orders were analyzed and averages computed, until finally the company had sufficient data whereby it could tell to a dot how much it would cost a person for the up-keep of his car. They had the figures to prove things.

Since 1917 the company has had a flat rate charge for every service and maintenance operation. That in itself is commendable. But last year the company went a step farther and not only told a man how much any particular repair job costs, but told him exactly how much he must spend per day on the maintenance of his car to keep it in the best of condition.

The Overland-Wisconsin Company takes the view that service and maintenance are two factors which must be looked upon to keep a man sold on the car he has bought.

To put it another way. After a salesman has sold a car, the sale is not complete; the service department sells him all the time he drives the car and thus keeps him sold until the time again arrives for the new car salesman to sell him another car.

Service a Department of Sales

Thus service is essentially a department of sales, with the Overland-Wisconsin Company. In fact, there is no service manager, literally speaking; service is in charge of the assistant sales manager. It has been this dove-tailing of sales and service which has made possible the accomplishments of the company.

In December 1922 the company announced that it would take care of one year's upkeep on each new Overland sold at the rate of 10 cents a day, excluding, of course, such units as the battery, tires, speedometer, etc., which are guaranteed by their makers.

This announcement was only possible after many years of preparation. It meant working overtime, very often, studying and compiling data. It meant sorting out thousands of repair orders. From the assortment averages could be figured. The frequency or infrequency, as the case might be, with which certain service and maintenance operations had to be performed were ascertained.

Figures arrived at indicated that it was reasonable to say a man could operate his own car for 10 cents a day.

Pinning Down the Upkeep

The world is getting on. The latest bit of encouragement is the discovery that the "guess" can be taken out of the cost of upkeep of automobiles.

Heretofore the auto owner has had the idea that the upkeep of a car in dollars and cents was a very hazy thing—hazy except when the bills came in. It might strike him hard or it might strike him easy. If he got off for a small outlay he chalked it up to "good luck" or he praised the particular make of car that he had.

Now a Milwaukee company has figured out, and will shortly put into operation, a plan by which it agrees to keep up its cars over a period of a year for the cost, a day, of a loaf of bread.

That's getting down to business. If that becomes general the auto owner will know just where he stands. Owners who have bought cars and then discovered that, after the purchase outlay, the drain for upkeep has been too great for their pocket-books need not make that error again. They will have the facts.

In addition, such a plan would force automobile manufacturers to standardize their product to a given point of perfection. If their cars run unequally in point of wear resistance, then the guess comes back on them in increased expense for making repairs. They couldn't afford to take chances with uneven production.

The editorial which appeared in the Milwaukee Journal, Jan. 17, 1923, commenting favorably upon the Overland Wisconsin company's way of selling its maintenance

This 10 cents per day plan was the first effort made to tell the owner of a motor car what his maintenance cost would be.

Naturally some cars would run considerably under this figure. Others would go over. The human equation entered into this like everything else. Nevertheless, the company guaranteed that the cost to the owner would not go over 10 cents per day.

The 10 cents per day plan caused quite a sensation in the community. It

was the first time a motor car concern had taken the guess out of service. That was remarkable in itself.

But the company did not stop there. As time went on more figures were compiled. The company realized public opinion had decreed that merchandise would be sold by comparison. The promises of dealers to take care of customers' service often are taken with a grain of salt. There was still the guess in service. And so, while the Overland-Wisconsin Company was doing a fine piece of work with its 10 cents per day plan, it did another thing.

Reducing the Upkeep Cost

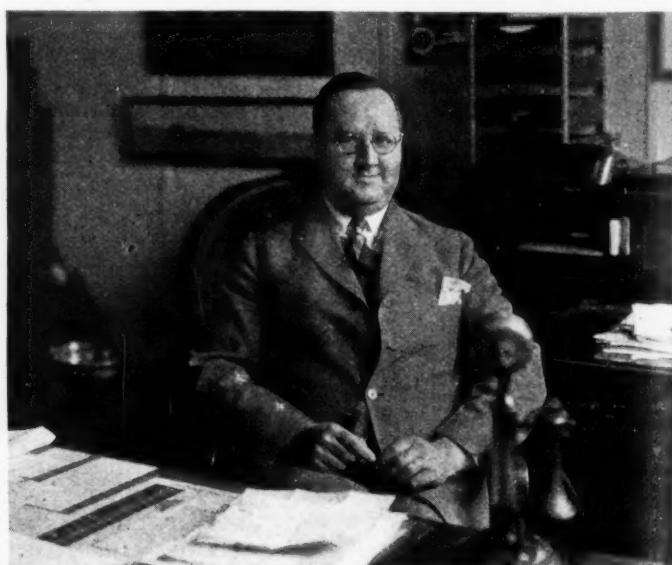
Amid the shouts of "You can't do it" the company not only proved it could be done, but reduced the cost to 7 cents a day. This was so favorably received that editorial mention of it was made in a Milwaukee newspaper. This editorial in a sense stated that at last the ice had been broken and a real effort made, at least by one company, to eliminate all guesswork from automobile upkeep cost.

It is a protection to customers. All of the nine community dealers of the Overland-Wisconsin Company operate under exactly the same plan, so that any Overland owner can get the same service regardless of from which dealer he buys his car.

At this point the reader probably is asking "How do they do it?" How they do it is largely a matter of what has gone before. It is well to remember that the Overland-Wisconsin Company has been doing business for 17 years. It has been successful through good times and times of depression because of having practiced sound business judgement and because of having adopted all of the fundamentals of good business.

Idea Started in 1913

George W. Browne, president of the company is the oldest Overland dealer in the country, was the first president of the N. A. D. A. and is at the present time president of the Milwaukee Automobile Dealers Association. It was Mr.



The men who guide the destiny of the Overland Wisconsin Co. At the left is George W. Browne, president of the company and whose ideas back in 1913 lead to the adoption of the fixed price system. Right, P. C. Gartley, vice-president



With the book on fixed labor operations compiled by the Overland Wisconsin Co. any Overland and Willys-Knight dealer can operate on the fixed price system after a day or two of preparation. Here is shown A. F. Roesch who figured the prices in the book, selling a dealer on the value of it. Mr. Roesch recently approached 18 dealers and sold 17 of them the system

Browne's idea back in 1913 that service could be sold on a flat rate basis and to that end the company started to compile figures and prices for service operations.

For four years it did nothing but compile figures and finally in 1917 the flat rate system was sold to its customers. Up to the present time the company has compiled 9,906 prices covering as many operations. These prices are spread over 11 models of Overland and Willys-Knight cars.

Effect on Used Car Sales

The full significance of this will be realized when one considers that it is possible for the owner of an Overland or Willys-Knight car of several years ago to get all his service and maintenance work done at a fixed price. And if you think this has not had its effect on the used car business so far as the Overland-Wisconsin Company is concerned, it is well to state here that the company during its business life has sold over 18,000 used cars.

The man who buys a used Overland or Willys-Knight car in Milwaukee and vicinity knows he is taking no chance on the maintenance of that car, so far as the prices for the work is concerned.

It is not only on the current models that the fixed prices are available, and the buyers of used cars are not, therefore, out of luck on the flat rate plan. The Overland-Wisconsin has thought of the used car buyer and has made the used car an integral part of its institution and has treated it as a clientele building branch of the business.

Vast Amount of Work Necessary

It is a comparatively simple matter to get up a fixed price schedule of operations on any current model of car, but to spread this over a large number of

older models obviously entails considerable work. It would be well for dealers who contemplate the flat rate system for their service and maintenance department, to appreciate the fact that there is an endless amount of work in connection with the proper establishment and proper execution of the flat rate system.

If one studies the time figures of the flat rate operations as compiled by the Overland-Wisconsin Company it becomes

apparent that the figures were not guessed at. Thus, in many instances we find that certain operations performed on the 11 models will vary in the different models by several minutes.

It was not sufficient to work out the time required to do a certain job on one model and take for granted that it would take about the same time on the other models. Had this been true the book which the company brought out recently covering the flat rate prices on all operations for 11 models of Overland and Willys-Knight cars would not have been quite so difficult to prepare.

This book is probably the most complete of its kind. Similar books have been produced of late by other organizations, but it is doubtful if any concern has brought out a book of fixed labor operations covering 11 models.

Figures Given Are Average

Another distinct advantage of this book lies in the fact that all the labor operations were compiled under average conditions. No special machinery was used to perform even the simple operations. Thus valve grinding, for instance, was done with the old hand method wherein the mechanic manipulates the valve with a screwdriver. The small dealer's shop probably does it this way, and the book, therefore fits his organization very well.

Now, should the dealer see fit to install labor and time saving machinery to do any of the operations, he is just that much to the good, providing he charges for the equipment. Just because he might do the job in less time is no reason for cutting the price of the operation. A baker may put in a battery of excellent ovens and dough mixing machinery, but all that would not cut the price of a loaf of bread.

The actual prices for the operations

Proof of Our Faith in Overland

In January this year we announced the revolutionary plan of guaranteeing upkeep costs. Our 10c a day upkeep plan took Wisconsin by storm. Now we offer a still lower price guaranteed upkeep plan. The goodness of the car has made this possible. We can now GUARANTEE to maintain an Overland car for one year for 7c A DAY because our experience during this season has proven that is a fair average for mechanical and service maintenance.

**7¢
Per
Day**

For One Year's Upkeep

We will keep any new Overland car in proper running condition, including labor and parts (excepting only tires, batteries and speedometers, which are guaranteed by their manufacturers, and damage from wrecks or collisions) for an entire year at a cost of only 7 cents per day.

What other car in the world equals the economy of the Overland?

What other car has ever been sold under such an unlimited guarantee?

To help the good cause along we will open our books to any competitor. We want to help competitors help themselves. We are willing to show them how OVERLAND can offer this sensational 7c a Day Plan. The owners will benefit.

"My cards have been on the table. I invited competition—why won't they meet my offer?"

Boyle

Buy Your Car From Your Nearest Dealer on This 7c per Day

ARMEL AUTO CO.

12 North Ave.

INC.

FINKLER MOTOR CAR CO.

Third and Wright Sts.

S. B. JACK AUTO SALES

597 Lincoln Ave.

Part of the newspaper advertisement run by the Overland Wisconsin company calling attention to its 7 cents per day plan. Several such advertisements have been run and each has served to give the car owner or prospective car owner a definite figure on which to base his upkeep costs



This illustration shows a typical dealer establishment working on the flat rate basis as evolved by the Overland Wisconsin Co.

in the book are not listed. The time for doing the operations is given and from this any dealer easily can establish the price, depending upon the price at which he sells his labor. Thus, if he charges \$1 an hour and the book of labor operations shows that a certain job requires 3½ hours his price for the job is \$3.50 exclusive of parts. If he charges \$1.50 per hour, it would be \$5.50. The community dealers all charge the same price for their labor operations and consequently all Overland owners are assured of being charged actly the same price for any service operation regardless of which dealer's shop does the work.

The system is being installed over the entire state of Wisconsin and inasmuch as the operations have been prepared under average conditions it requires but a day or so for any Overland and Willys-Knight dealer to put it into effect.

About two months ago the Overland Wisconsin Co. retired from the retail field in Milwaukee and now devotes its entire attention to wholesale trade. Previous to this the company had operated the service department of its retail business on a basis whereby the mechanics were paid piece work.

This piece work plan now is being used by its community dealers and works out successfully for dealer, customer and mechanic. Reference to the illustration at the head of this article will show what takes place in a shop operating on the piece work plan and in a shop run otherwise, particularly on the hourly rate basis.

Mechanics Always Busy

Go into any of the Overland Wisconsin community dealers' shops and you will find all the mechanics busy. They are being paid in proportion to the work they do and naturally this is an incentive for doing all the work possible. Records show that mechanics on the average do 20 per cent more work on the piece work plan than on the straight hourly plan, which means, of course, greater output for the shop without any additional overhead.

The plan as practiced by Overland here also protects the dealer as well as the customer against the carelessness and slowness on the part of mechanics, which too often exists when they are operating on the hourly basis.

Overland also has proven here that the piece work plan attracts the best mechanical skill. It automatically weeds out the poor mechanic; the man unable to produce sufficient work to warrant his being kept on the pay roll. Furthermore, it does a fine piece of work in weeding out the so-called helper. In the service departments of the Overland dealers here, every mechanic operating



With the fixed price system there is a definite understanding between customer and management. The customer signs the repair order after the prices for the operations have been given him by the service salesman who is guided by the book of fixed labor operations

on the piece work plan does every bit of the job on which he is working. He cleans the parts, does the disassembling and reassembling, and thus has complete control over the entire job.

For the dealer operating in a small community the Overland Wisconsin advocates the premium plan for paying the mechanics. This differs from the piece work plan in that the mechanic works for so much per hour. If, however, he does any job under the specified time he splits this time with the company. Thus, if a job calling for 4 hours is done by him in 3 hours, he gets extra pay for ½ hour's time. This plan is working out excellently in the case of the small town dealers in whose communities there is not sufficient volume of work to warrant the piece work plan.

It also has been found that mechanics working under the piece work plan, or even under the premium plan, are inclined to solicit repair and maintenance work for the dealer's shop. The men receive a certain commission on each job, which means that during the dull months of the year the dealers' shops will have sufficient work to keep the crew busy. This eliminates laying off part of the crew, which very often effects the best skilled men in a shop operating on the straight hourly basis.

For several years the Overland-Wisconsin Company has operated on what is known as the 40-60 plan as regards the mechanics in the shop. This, in connection with the flat rate plan, premium plan and piece work system is a story in itself and will be taken up in an early issue.

San Diego's Attempt to Cope With the Rent Battery Situation

AP. SKINNER of San Diego, Chairman of the Battery Craft of the Automobile Trade Association of that city, several months ago began collecting data in regard to the number of rent batteries that were lost annually by the battery dealers of his city. The figures he collected were appalling and he immediately set out to devise a means to remedy the situation.

Skinner's idea was to adopt a branding iron that would be used universally so, with the assistance of a few other battery men in his community, all dealers were called upon and the scheme was explained in detail. This method of keeping track of batteries by branding them on the sides of the boxes appealed to the battery merchants, especially so in view of the fact that the cost of the branding irons was so reasonable. Each iron reads: "SD RENT—"

The SD portion of the brand is a code indicating a certain battery dealer and all those dealers who adopted this method of keeping track of batteries were furnished a list giving the names of establishments corresponding to the code letters. While the plan has only been in operation in San Diego for a short time, the loss of rent batteries has decreased noticeably.

Success of New York Show Gives Confidence to Industry

Dealers and Manufacturers Alike Leave Metropolis Convinced That Another Good Year Has Started

THE undoubted success of the New York show from both an artistic and attendance standpoint gave a new courage to the leaders of the industry gathered there. The announcement during the week that the Automotive Industries census of motor vehicle registration as of Dec. 31 showed 15,281,000 motor vehicles in use confounded the prophets to an extent that they threw up their hands and declared "We do not know the possibilities of our own business. We are in the hands of the people."

Dealers who were in New York during show week were, perhaps, more encouraged than the manufacturers. The basis of the dealer encouragement was the greater and more intelligent interest shown in their affairs by the manufacturers. This greater interest was manifest in many ways.

Manufacturers Show Interest in Dealers

The dealer dinners given by manufacturers were much more satisfactory to the dealer body. Apparently a great many manufacturers have had new thoughts, and have decided that dealers do not go to New York chiefly to view women in scanty attire and to violate the prohibition law. The meetings as a rule were quite business like and were well attended. In fact, two organizations in the lower price class were not able to find accommodations for all of the dealers who wanted to attend the dinners.

Dodge Bros. deserted all previous precedent and a more detailed description of their plan will be given later.

The real triumph of dealer interest, however, was the meeting held by the National Automobile Dealers' Association at the Commodore Hotel on Thursday. This meeting was held on short notice and was advertised only during the last few weeks, when so many show announcements were being made that it could not get proper attention.

More than 400 attentive men were in the room at one time during the morning session, and a larger audience in the afternoon. Among those present were A. B. C. Hardy of the Oldsmobile factory and C. W. Nash of the Nash factory, and reports from these and other factory men present were that they were pleased with the work of the N. A. D. A., as illustrated at this meeting.

The program of this meeting was very similar to that which the association has been giving at the district meetings in many parts of the country. The message of the speakers was much the same, and these have been outlined in MOTOR AGE news columns as these meetings were held. The program follows:

The Dealer Outlook for 1924, C. A.



A glimpse of the New York Automobile Show

Vane, general manager.

Five Per Cent Net, C. E. Gambill, vice-president, National Automobile Dealers' Association (president Gambill Motor Co., Hupmobile distributor, Chicago).

Doubling the Salesman's Earnings and the Dealer's Profit, J. S. Knox, sales consultant, Cleveland, O.

The Greatest Asset in the Business, Percy Chamberlain, president, Percy Chamberlain Associates, Inc., Detroit.

Obligations of an Automobile Dealer, F. W. A. Vesper, treasurer, National Automobile Dealers' Association (president Vesper Buick Auto Co., St. Louis, Mo.).

The Dollar Value in Cars

There was one surprise, and that came at the end in the talk by Mr. Vesper, former president of the association. Mr. Vesper spoke briefly upon the obligation of the automobile dealer to see that the vehicles that he sold delivered transportation, then he departed from the text and told with what anger he recently had read the attacks upon the automotive industry by the clothing industry.

He said that following the publication of the attack by the clothing men, he had looked up U. S. Government index statistics and then had met a clothing merchant who was inclined to back up the attack. Mr. Vesper said that after the clothing man admitted that economists were right in their point of view

that 1913 was the year when a dollar was worth a dollar, he produced his figures.

According to impartial economists, Mr. Vesper said, that on a basis of 1913, the automotive industry is giving the buyer \$1.11 of value for each dollar, while the clothing industry is giving its customers only 51 cents of value for each dollar paid. The speaker had other value figures, but the point was made that the most recent and most severe critic of the automotive industry stands at the foot of the compilation of values.

Mr. Vesper said that he spoke quite positively to his friend, the clothing man, and pointed out to him that the present position of the clothing people was entirely indefensible from any standpoint of business or fairness, and that the industry that was giving the least in value for the dollar had little to do to grouch at the industry that was giving the most for the dollar. Mr. Vesper became quite warmed to his subject and enhanced his already high reputation as a speaker.

Other especially notable events of the week were the dinners of the various national organizations, beginning with the dinner of the Rubber Association of America on Monday night.

President Charles Clifton of the National Automobile Chamber of Commerce retired as toastmaster this year, passing the job to Roy D. Chapin. President Clifton said that he was retiring on the

honor bestowed upon him last year, when Will Rogers said that he was the best toastmaster he had ever heard. On that occasion President Clifton announced, "Gentlemen, Will Rogers will speak to you."

Toastmaster Chapin briefly reviewed the year's progress in the automotive industry and introduced Charles M. Schwab as the speaker of the evening. Mr. Schwab pleaded for humanity and personality in business, and after paying tribute to the great growth of the motor industry and predicting that this industry, like steel, would continue to confound its critics and leaders by its progress, he expressed the belief that the next advance would come in the lowering of the cost of distribution. He said that under present conditions distribution costs were too high and that they must be lowered over the next period of years.

Schwab Makes Startling Suggestion

One suggestion made by Mr. Schwab was received in entire silence, as compared with frequent applause that he had previously received. This was that the automotive industry should resolve itself into ten or twelve manufacturing companies.

Mr. Schwab was quite jocular and friendly in his remarks, basing his claim of friendliness on the fact that he was now a part of the industry. He said that he had declined to speak before a radio because he was going to talk among friends, not to a hidden audience. He also said that the speech that would be printed had been written by a press agent, intimating that he declined any responsibility for what appeared in the newspapers. And it was well that he did, as the headlines that later appeared, built on the distribution paragraphs of his talk, did not make a profound hit with dealers.

In his familiar remarks Mr. Schwab spoke of meeting President Sloan of the General Motors, and that Mr. Sloan had brought forward members of his staff, and in introducing them had remarked the part that each man was doing. That, he said, was the keynote of successful organization—giving credit where credit was due.

The decorations for meritorious conduct were distributed in the usual humorous style, Harry Meixell of the N. A. C. C. staff making the presentations. Those honored were Capt. Eddie V. Rickenbacker, F. J. Haynes of Dodge, Walter P. Chrysler, Roy P. Chapin of Hudson, Alex P. Sloan, Jr., of General Motors.

Edward S. Jordan was toastmaster of the Society of Automotive Engineers dinner on Thursday and contributed much to the merriment of the week by his announcement that a gigantic automotive merger had been organized under the chairmanship of Roger Babson, and in the naming of the staff came a number of clever quibs at the expense of automotive engineers and executives. The speaker of the evening was President Burton of University of Michigan, on the subject "That Mind of Yours."

President Burton's treatment of psy-

chology was quite novel to most of his audience and quite illuminative of the progress that has been made in this study, also marked by numerous sallies of wit through the discussion of the various types of mind, of which the creative was the useful type. Too many minds, the speaker said, were merely of the type upon which things could be etched and which served only as a memory, instead of a thinking machine. In concluding, President Burton said:

"It is quite impossible to have a clean, creative mind without a clean, healthful body and clean and progressive habits."

Now back to the show. It was considered as a great victory that the attendance at the show was practically equal to that of last year. In the evenings the great armory was jammed at times. Thousands of visitors went to the balcony and enjoyed the walk around the great exhibition floor. The extent of the exhibition can be judged by the fact that this walk around the balcony was one-third of a mile, and it was an interesting walk. One thing revealed by this walk was that only the Pierce Arrow cars are now made with the ventilators in the roof, a thing that was quite common a few years ago. Also it gave a new idea as to the relative size and height of the cars.

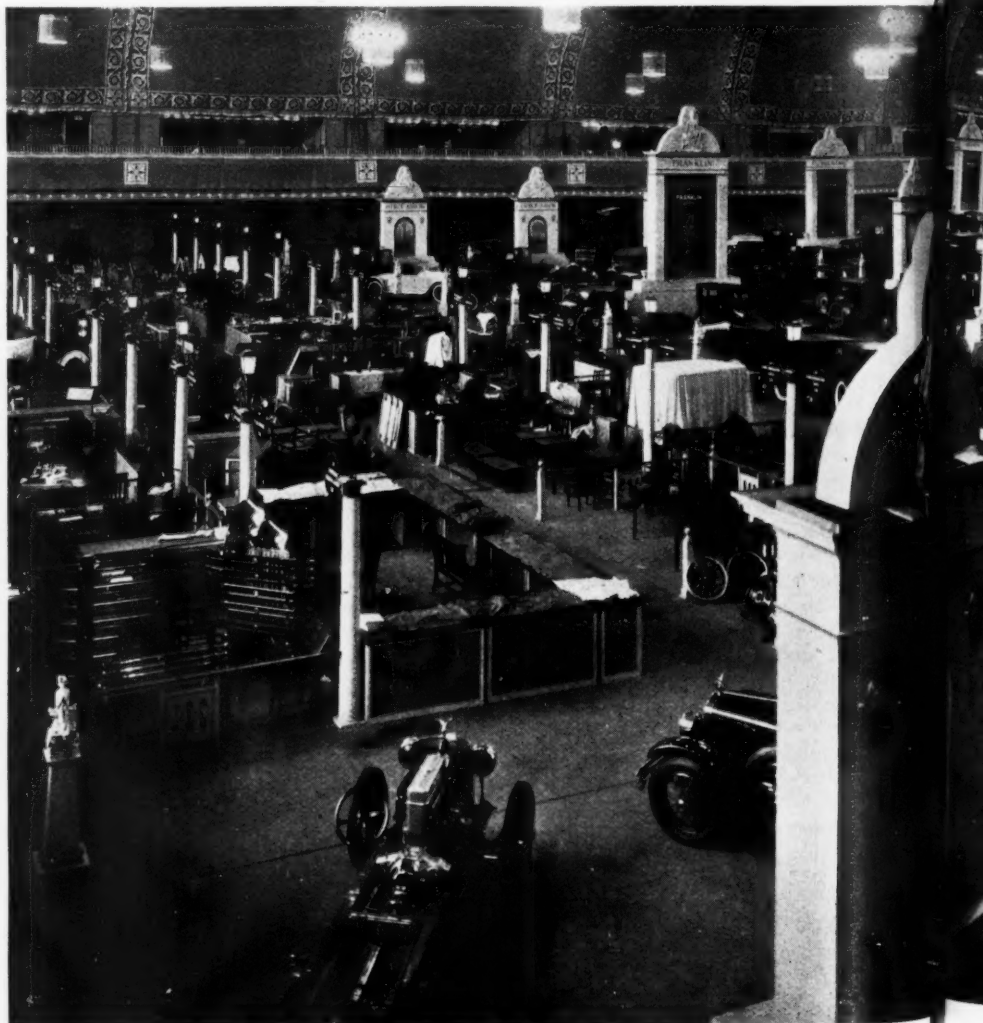
But with an attendance almost equal

to that of last year, there did not seem to be as much buying as during the last two shows. Some companies reported good sales, others found sales slow. Those most interested in this phase were left wondering whether or not the public was not buying for some reason or whether those in charge of the exhibits were more truthful, as suspicion has always attached to show sales reports.

Visitors Look Like Buyers

This much can be said for certain. It was in the main a new group of visitors. They looked like the buying sort, and they were interested in cars, and especially in four-wheel brakes and balloon tires. And few of the salesmen present were able to discuss these subjects with the visitors. Indeed, most of the visitors had apparently read the newspapers and knew or thought they knew more about these things than the salesmen, and if they read the right articles, there can be little doubt but that the visitor was right, for evidently the salesmen were not keeping up with the publicity.

The salesmanship appeared to be better in the main than previous years, but there was a lot of room for improvement. Onions appeared to be a favorite dish in the show restaurant, according to reports of people who tested out the salesmen. Ignorance of the product seemed to be



This panoramic view of the armory gives one an idea of

the greatest vice. The accessory and unit stands appeared to be much better manned in regard to information.

A visitor to many booths found himself quite unannoyed by any sales attention. As a matter of fact, one got the impression that the salesmen were there to attend the show quite as much as those who paid 75 cents.

This must not be construed as a sweeping criticism, as there were samples of good approach, good information, as the writer can testify, but the average standard of salesmanship could have been much higher and have resulted in more sales.

One couple, quite a prosperous looking man and wife, went through the show for more than two hours and were not once bothered by any salesman. And the crowd present at that time was no excuse. Other visitors were approached many times, always pleasantly but not always effectively.

Usual Entertainment Provided

There were, of course, the usual arrangements for the entertainment and instruction of dealers by the various companies. In the main the old plan of having a dinner for dealers, with some entertainment and talks by factory officials later was followed. These talks told in a general way of the factory and

dealer plans and contributed much toward a better feeling between the factory and the dealers.

Dodge Bros., however, adopted a different plan, that apparently made a hit with the dealers in that car. Headquarters for the entire week were established in the roof dining room of the Hotel Pennsylvania. With proper allowance for the decorations, the great room was made into a sort of miniature executive office. At the numerous desks about the room were stationed department managers, and each had with him several of his assistants, and back of the desk was an exhibit that illustrated some of the workings of his department.

In one end of the room was the advertising department, where the advertising manager and several of his aids were explaining not only the theory and intent of Dodge and Graham vehicle advertising, but how it was made, the cost of making up the advertising copy and numerous other details.

At the other end of the room was a space devoted to the service and engineering departments, where tools and parts were shown. An exhibit of the flat rate method and similar helpful dealer information. The special Dodge design points were illustrated with parts and a man was there to tell why this design.

An especially interesting exhibit was that of the shipping department. This exhibit consisted of freight cars of various types built to scale, also Dodge motor cars built to the same scale. These miniature motor cars were constantly being loaded and unloaded into freight cars to show why certain assortments were shipped together. Also the allotment department had an explanatory exhibit.

There was no doubt in the minds of those who visited this headquarters that the dealers were intensely interested, and that they were learning a lot of things about why certain factory practices could not be altered at their every request.

There was a meeting of the show managers from the eastern section of the country on Wednesday. The managers came to study the New York show, and they met to discuss plans that they were making for their own shows, also the latest and best features of association management. It developed that the associations are giving a good deal of attention to sales and service educational courses and that the dealer members of the associations find these schools quite helpful.

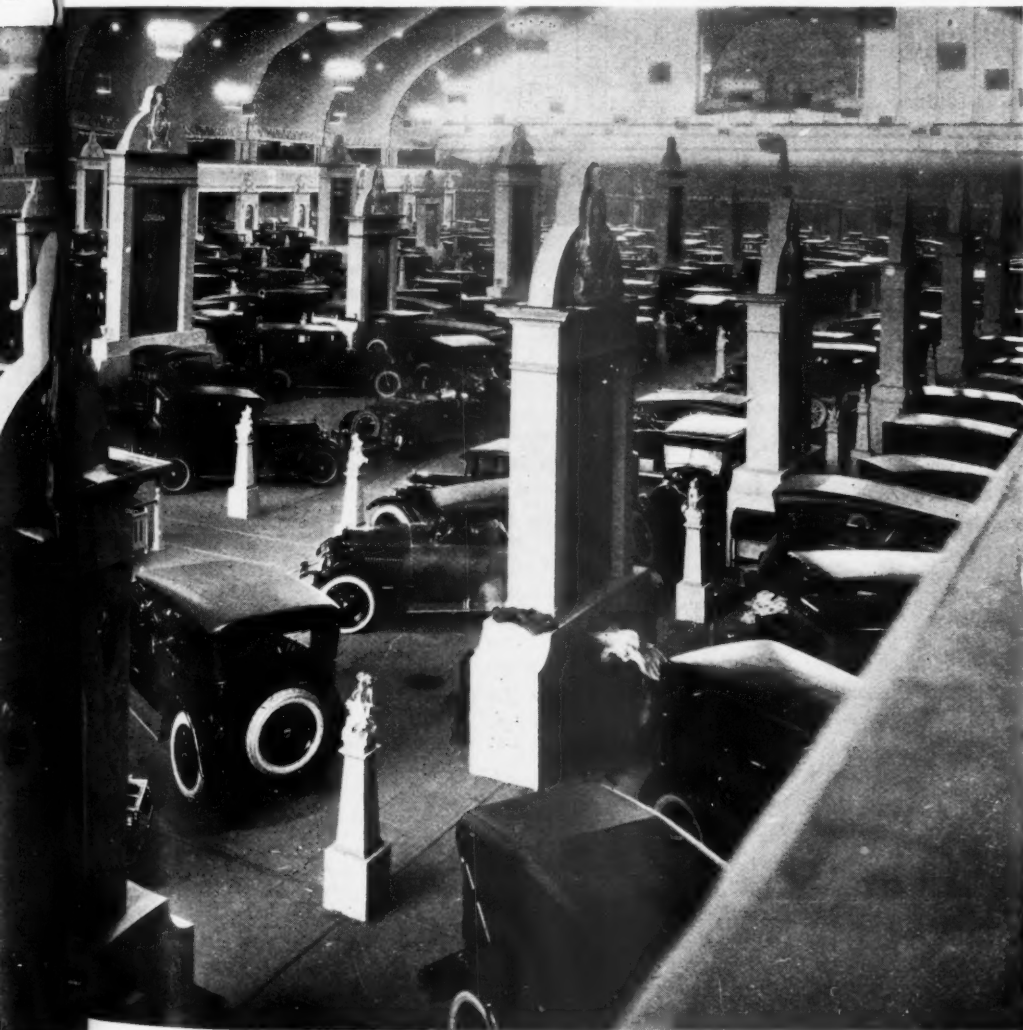
The Meritas exhibit, which attracted so much attention last year in the Commodore Hotel, was back this year. Meritas is a fabric which the makers contend is suitable for the entire body covering. On the bodies exhibited, the same material was used for top, sides and hood covering. One of the bodies exhibited this year was the same as was shown in 1923. This body had fabric fenders. It was stated that since the body was on exhibition at the 1923 show it had been run more than 20,000 miles, and certainly it did not show much wear. It was stated that these bodies would soon be available for dealers in certain cars.

Some Names Missing

The show was so large and so interesting that one did not at first miss any of the familiar exhibits. It looked like a complete showing of the industry, but when you scanned the statistics presented as to highest and lowest price, you realized that Locomobile and Rolls Royce were not present. Neither was Ford. Rolls Royce and Ford have not been a part of the National Show in New York, but the Locomobile has been in until this year. The present step seems to indicate an increasing importance of the fall salon and similar shows that are held in New York.

The efforts of the salesmen in the exhibits this year did not appear to draw as much criticism as in previous years, but some rather amusing stories were told. One visitor told of going into an exhibit where were cars that had four-wheel brakes for the first time. These cars had come direct from the factory, and it was one of the surprise exhibits. The visitor being of a mechanical turn of mind, asked something about the brakes. The salesman stalled for a question or two, then turned away rather disgustedly and said:

"You must know as much about the



the great size of this year's New York Show

Mechanical Features of New Cars Shown at New York

Wealth of Improvement and Attention to Details in Evidence. Better Regulators For Windows, More Attractive Dash Layouts and Greater Durability in Coach Type of Bodies Noticeable

IN addition to the cars exhibited at the New York show and described in part in last week's issue of MOTOR AGE, there were several new cars on show in the display rooms of New York dealers.

Following are the new cars which either were new at the show or privately exhibited on New York's automobile row.

Eagle Six Latest Durant Product

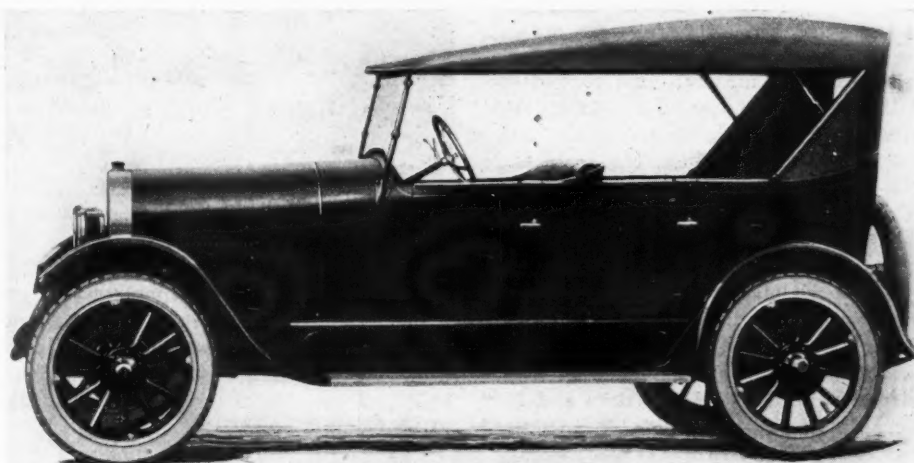
W. C. DURANT'S latest product is the Eagle Six, the phaeton of which lists at \$820 f. o. b. Flint. This car has 115 in. wheelbase and is equipped with four-wheel brakes as standard equipment without extra cost. Besides the five-passenger phaeton, which was on exhibit at the Flint salesroom on Broadway but was not at the show, there will be a sedan model the price of which is not announced.

Except for the Oldsmobile, the Eagle is the lowest price six on the market. It comes between the Star and the Durant in price and resembles both in certain respects. It is fitted with an engine of Continental manufacture and has a bore of 3 1/4 and a stroke of 4 1/4 in.

Other units include a Warner gearset, Spicer universals and Adams axle. The chassis has the same tubular "back bone," single-plate clutch and steering gear which are characteristic of other Durant products.

The model on display at New York was equipped with four-wheel brakes.

The steering system is similar to that on the Star and incorporates a transverse drag link. The steering wheel has a central horn button, but spark and



The Eagle Six, a Durant product selling for \$820, f. o. b., Flint, Mich. It was exhibited at the Flint salesroom on Broadway during the show

throttle levers are underneath the wheel.

Springs are all semi-elliptic. The rear pair is underslung and metal rebound hooks are provided. Hotchkiss drive is employed. Wheels are wood spoked and are painted blue to match the body which has a fine white two-line stripe near the top. The hood is not striped but is finished in plain blue. Fenders and other sheet metal work are enameled black. A nickel radiator shell and lamp doors are provided and there is a polished aluminum strip between the hood and the forward edge of the cowl.

New Model Westcott With 7 Bearings

THE Westcott car is shown in a new model 60 which is built on a chassis

especially designed for closed bodies. It is equipped with a new six cylinder engine having a seven bearing crankshaft. The bore is 3 1/4 inches and the stroke 5 inches. As exhibited this chassis is fitted with a 5-passenger sedan body which is the type of body to be used exclusively with it.

Light weight has been one of the chief considerations in design in combination with balance and riding comfort. The complete car, it is said, weighs little more than 3000 lbs. Rigidity of frame construction is obtained by a large plate tying together the entire rear of the frame and supplementing the usual cross members.

A new manifold is fitted which, together with thermostatic control of the gasoline mixture, is said to give marked efficiency and rapid acceleration.

Either four-wheel brakes or balloon tires are fitted as optional equipment at extra cost.

New Line of Bodies For Lincoln

A NEW line of bodies is shown by Lincoln. One of the newest is a custom two-passenger Judkins berline coupe selling for \$5200. Balloon tires are exhibited on the four-passenger phaeton and are sold at \$85.20 extra. These are the Firestone 34x7 nominal size. In the exhibit there is another Judkins custom body. This is a four-passenger berline. There is also shown a four-passenger phaeton, seven-passenger suburban limousine, seven-passenger sedan and a five-passenger touring.



The new Westcott five-passenger sedan, which has either four-wheel brakes or balloon tires as optional equipment

Three New Models Added to Davis Line

THREE new models have been added to the Davis line for 1924, including the Mountaineer, a Berline-sedan and Utility brougham.

The Mountaineer is powered with the 8-R Continental engine which develops 68 hp. It has a wheelbase of 118 ins. Springs are of silica-manganese steel. Lockheed hydraulic four wheel brakes, of the external contracting type, operating on 12-in. drums both front and rear are optional at an additional cost of \$75. Balloon tires are also offered as optional equipment.

Another feature of the Mountaineer is the new Ross cam and lever steering gear, which is said to make steering easier, smoother and surer. Road shock cannot be transmitted through this gear, and the wheels cannot be deflected by obstacles in their path. According to Davis engineers the use of this gear overcomes all objections which have been advanced to balloon tires and four wheel brakes, because of the increased resistance to steering.

The Mountaineer series will include five body styles, the phaeton, a five-passenger phaeton; the roadster, a three-passenger roadster; the broudan, a four-passenger, three-door enclosed model; the sedan, a five-passenger car; and the berline sedan, a five-passenger enclosed model.

The equipment of all models includes cowl lamps, bumpers, both front and rear, extra Disteel wheel, trunk and trunk rack on the phaeton, broudan and berline sedan. All Mountaineer enclosed models are equipped with cowl ventilator, interior heater, rear vision mirror, sun visor, dome-light and door locks. Each model is finished in a number of optional colors from which the buyer can make his own choice, without additional cost.

The Utility Brougham, Model 79, is a standard, five-passenger three-door enclosed car selling at \$1495. It has three doors, two on the right and one on the left. Both front and rear seats are of



The new Davis Mountaineer which can be had with balloon tires and four wheel brakes at additional cost.

standard, permanent design, running the full width of the car. Upholstery is of velour. The finish is deep maroon and equipment includes Disteel wheels, aluminum military steps, skirt fenders, nicked radiator, MotoMeter and trunk rack at rear.

The new Berline Sedan, Model 78, has an unusually low-slung appearance, although head-room has not been cut down. The rear upper body panels are faced with black leather, and contain oval windows, surmounted by ornamental top bows. The interior is upholstered in heavy velour.

Equipment is unusually complete, including heater, dome-light, door locks, cowl ventilator, sun visor, cowl lamps, double-bar spring bumpers, trunk and trunk rack, polished aluminum luggage rods, extra Disteel wheel, and MotoMeter. The Berline lists at \$1895, and is finished in midnight blue, Royal blue, C. P. green, maroon, beaver brown, at the option of the buyer without additional cost.

Both models are mounted on the Series 71 chassis which has a wheelbase of 115 in., and is powered with the 7-U Continental engine. The chassis incorporates such units as Timken axles, Delco electrical equipment and Borg & Beck clutch.

Silica-Manganese springs are used throughout, and Goodrich Silvertown cord tires are standard.

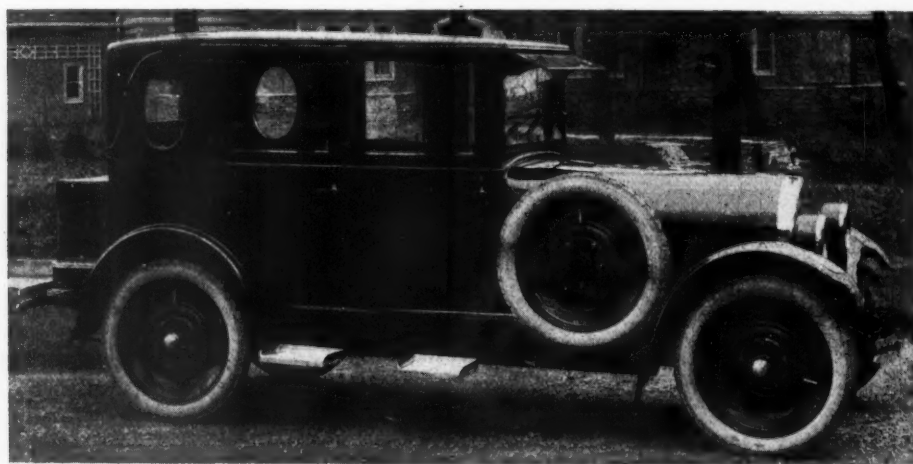
Hudson Changes Manifolding

THE changes on the Hudson engine were shown for the first time. They consist largely of alterations in the intake and exhaust manifolds. These instead of being on the left side as formerly are now combined on the right side leaving the left of the engine entirely free from accessories. Formerly the hot air intake was carried over the top of the engine but the new construction does away with this piping. A new carburetor, the Stewart, has been adopted and in connection with the new exhaust manifold there is a new hot air stove in the form of a rectangular box around the exhaust manifold just behind the carburetor.

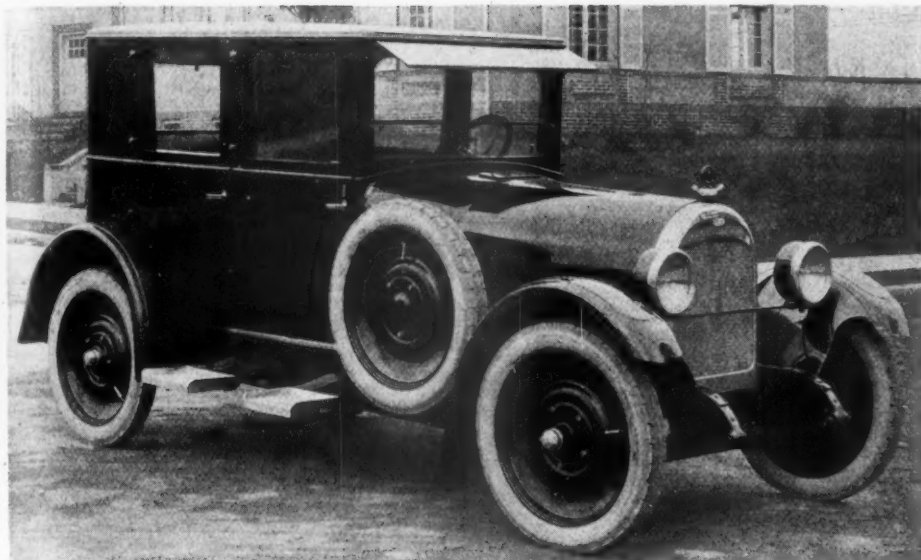
There have been some body alterations particularly in the coach. The roof of this has been dropped two inches and the seats lowered two inches. The leg room has been increased six and one-half inches in the rear compartment by lengthening the body and extending it out further over the rear axle. Hudson showed a four-passenger speedster and two five-passenger closed cars. There is also a stripped chassis which is particularly interesting from the fact that instead of nickel plating the parts, the polish is secured directly on the regular material.

Essex Exhibits Polished Chassis

ESSEX exhibits a polished chassis and a five passenger phaeton and a five passenger coach these two bodies comprising the complete line so far announced on this chassis. The chassis is noteworthy in that instead of being nickelled the polish is secured by polishing the original materials themselves.



Davis Berline-Sedan which sells for \$1895. The upper body panels are faced with leather and the upholstery is velour



The new Davis Utility Brougham, which sells for \$1495. The finish is deep maroon and equipment includes Distel wheels

Schebler Carbureter on Model X Case

J. I. CASE T. M. Co., is exhibiting its complete line including a three-passenger special roadster, a five-passenger touring phaeton, a five-passenger phaeton, a four-passenger suburban coupe and a five-passenger sedan on the model X chassis and a seven-passenger touring phaeton and seven-passenger sedan on the model Y chassis. A show chassis is also shown. The model Y was brought out only in August last, and no mechanical changes have been made in it since that time, but the Schebler carbureter has been adopted for the model X recently. The new model Y sells at \$2475 as a phaeton and at \$3325 as a sedan.

Hydraulic Brakes and Balloon Tires Regular On Kissel

THE Kissel Motor Car Co. now fit Lockheed hydraulic brakes and 32x6 inch balloon tires. On a new 7 passenger berlin-sedan these are standard equipment but on all other models they are fitted only as an extra. The adoption of four wheel brakes involved a number of other changes, such as the provision of an emergency brake on the transmission, but aside from these no mechanical changes have been made. Two new body styles are shown, the berlin-sedan already referred to and a 5 passenger victoria. The berlin-sedan resembles the brougham sedan, the chief difference being that it is mounted on a 132 in. wheel base chassis and that the elliptical windows in the rear quarters are larger and the doors wider. The victoria is a two door type of body with a folding front seat and a built-in trunk rack. All windows can be lowered. In addition to the new models Kissel shows a roadster with rumble seat, a 4 passenger torpedo, a landaulet, an Imperial limousine and a show chassis.

Oldsmobile X-ray Chassis

THREE closed models, two touring models and a cut away chassis comprise the exhibit of the Oldsmobile Six, model 30. There is also shown a touring car on the model 43 chassis. The three closed models shown are the coupe, cab and sedan. The sport touring and the standard touring make up the open car line.

Chassis Refinements On Marmon

A NUMBER of chassis refinements are shown on the Marmon. On the engine there is an improved water pump location, this unit now being mounted on the left front of the crankcase for accessibility and also to permit a better pump drive than previously. The pump is now driven by direct connection with the accessory drive shaft.

The fan has been moved closer to the radiator by putting the fan pulley behind the fan instead of in front of it. The fan drive pulley is now on the front of the crankshaft where the water pump formerly was located. The lubricating system has also been improved by

changes in the oil passage permitting centrifugal oil feed to the fan hub bearing.

An additional provision has been made for hot air for the carburetor. This is in the form of an air heater which may be detached in summer. There are a number of miscellaneous changes also through the chassis such as improved clutch facing, Non-Gran bronze spring bushings and Alemite chassis lubrication.

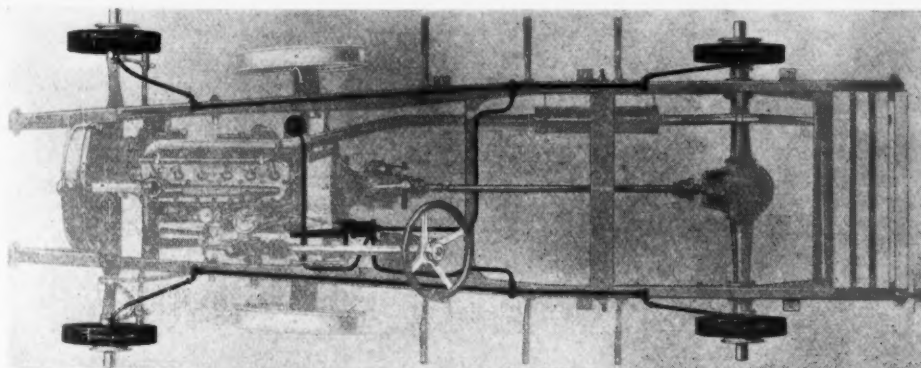
Body improvements include a new type of folding trunk rack, polished aluminum tonneau bars and an improved hood catch with a concealed mechanism. The front dust deflector is also of improved design, being larger and more practical in shape, covering the front axle and protecting the front of the car. Balloon tire equipment in the 34x7 in. size is available at \$175 extra.

New Rickenbackers Carry Full Equipment

TWO important changes are being made in the equipment of the Rickenbacker car, one is that the four-wheel brakes are now standard equipment on all models, there being no option. The other change is in the matter of equipment. The cars will now be furnished regularly with a considerable amount of extra equipment, including front and rear bumpers, automatic windshield wiper, windshield wings on open models, clock and vanity cases on closed cars and moto-meter. In connection with these changes the prices have been slightly advanced over the previous stock car price. Considering the addition of the four-wheel brakes and the extra equipment, however, the change really represents a considerable reduction in price. The new prices are as follows:

| | |
|---------------------|--------|
| Sport phaeton | \$1585 |
| Roadster | 1635 |
| Coupe | 2035 |
| Sedan | 2135 |

The car heater which was previously a separate piece of equipment bolted to the exhaust manifold, is now an integral part of the exhaust pipe and is made in the Rickenbacker plant. The radiator is approximately three inches lower than before, giving it a larger water capacity. Balloon tires may be fitted as extra equipment at an additional price of \$75. The size is 31½x5¼.



Plan view of the hydraulic braking system used on the Kissel cars. The layout is much the same as on other cars using the Lockheed brake system

Gardner Continues Line

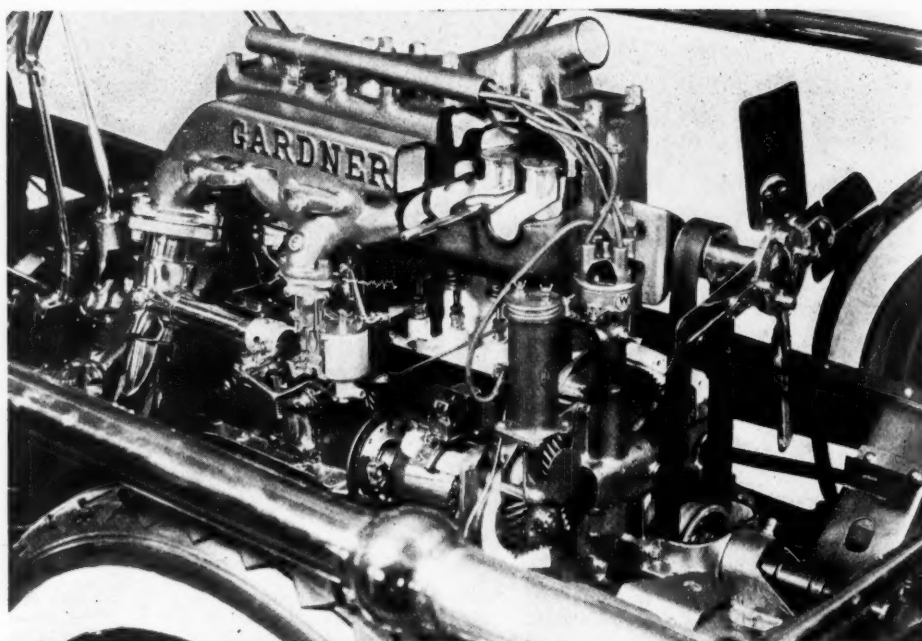
THE Radio Special sedan, the Sport Touring and the three door brougham are new Gardner models exhibited. The chassis changes are of a minor character. One of the chief features of the Radio Special is its complete equipment which comprises bumpers, spare tire on the side, trunk at the rear and complete cowl and interior equipment. In this exhibit is a gold chassis in which cutting to show inner parts has been carried to an unusual degree. The exhibit is made up of the new models mentioned and in addition a standard touring car and a coupe.

New Clutch On Maxwell

MAXWELL is exhibiting a complete line of seven bodies and a white and polished chassis in addition. A few changes in the chassis are noted, including a new single plate clutch of mechanics manufacture. The emergency brake drum on the propeller shaft has been increased from 7 to 8 in. and the engine now has a spring front support in place of a trunnion. The spring support is simply a short leaf spring set transversely permitting the engine to oscillate vertically without transmitting vibration to the frame. The cars shown include a two-passenger roadster, five-passenger phaeton, four-passenger standard coupe, two-passenger club coupe, five-passenger standard sedan, five-passenger club sedan and a sport model.

New Chevrolet Coupe

CHEVROLET is showing a new four-passenger coupe selling for \$725. A number of chassis changes are also exhibited. Among the interesting changes are an increase in brake size and a change in the method of brake operation.



Close-up of Gardner engine in the special chassis. Every important unit is cut to show the inner secrets of operation

The brake drums are now 13 in. in diameter in place of 12 and the brake width $1\frac{1}{2}$ in. instead of $1\frac{1}{4}$ in. The operation of the brake is by rod instead of cable.

Owing to the fact that the engine is set higher in its supports, the steering gear now passes under the supporting line of the engine instead of over it. The front axle is now straight instead of curved or dropped and the rear axle has been changed and the housing at the center is pressed, instead of cast. The rear spring shackle is now fixed to the housing, being riveted to it and is free at the spring end, giving a more flexible spring support. An alemite fitting is supplied at spring end for shackle lubrication.

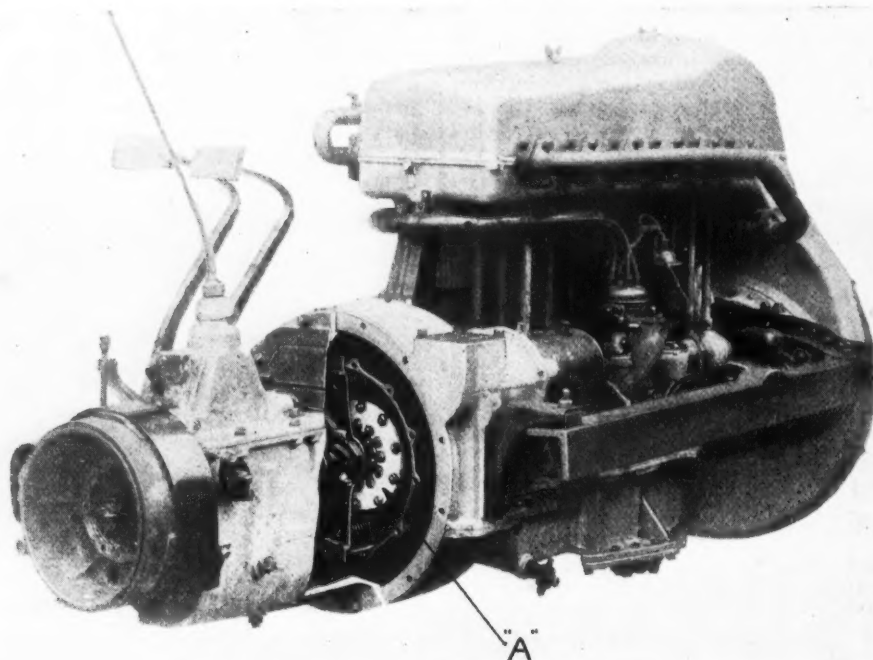
Barley Carries Seven Main Bearings

A FEW alterations of a detailed nature are shown at the Barley exhibit. The hood and cowl have been raised two inches giving a higher radiator and improving the appearance of the front end. Hydraulic four-wheel brakes are now fitted without extra charge. The engine in this car is now Herschell Spillman seven bearing six. No changes have been made in the Roamer.

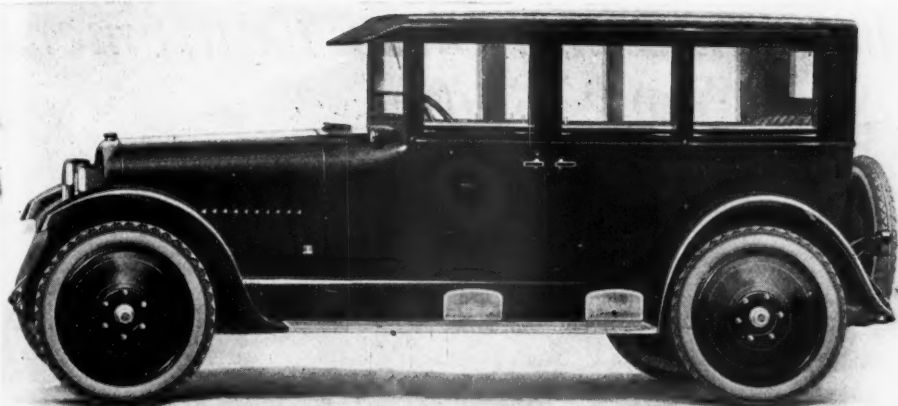
Franklin Power Plant Now Fitted with Vibration Absorber

FRANKLIN recently has put into production on its engine a vibration absorber incorporated between the friction disc or mats and the central driving spline hub in the single plate clutch.

The two rubber mats designated by A are of the ordinary fabric disc material such as used in the propeller shaft universal joint installations and where flexible drives are desired. These discs being more or less flexible and easily distorted act as a cushion for vibration between the crankshaft of the engine and the transmission driving gear shaft so that any torsional vibration of comparatively small amplitude are not transmitted from the crankshaft by any solid metallic member back into the transmission and driving shaft of the vehicle but are carried and cushioned by the two rubberized fabric discs which are incorporated in the clutch. This portion of the drive line being a rotating member must be put in running and static balance and this is done by placing a small weight on the periphery of the disc, as shown by B.



Franklin vibration absorber, showing how it is mounted in the single plate clutch of the powerplant



The new Nash six-cylinder special sedan which was shown for the first time at the New York show

Paige-Jewett Show Balloon Tires

BALLOON tires for \$100 extra on the Jewett and \$195 extra on the Paige are announced at the show. The Paige and Jewett exhibits show practically the complete line of both sixes. The balloon tires are the Firestone and on the Jewett are the 5.25 size on the 21 in. wheel and on the Paige the 7.3 size on the 20 in. wheel.

Elcar Has New Model, New Tires, and Brakes

AN entirely new chassis model known as the 6-50 is introduced by Elcar. One of the new models known as the demi-sport is shown. This sells for \$1220, with standard equipment. Four wheel brakes on balloon tires are now optional on all models. On the 4-40 and 6-50 models the balloon tire equipment sells for \$110 for five tires. On the 6-60 model the balloon tire equipment is \$150 extra.

The four-wheel brakes provided are the Salisbury type mechanically operated. At the exhibit Elcar shows a 6-60 sedan with balloon tires, a 4-40 sport brougham with balloon tires and a 6-50 demi-sport with four-wheel brakes and balloon tires.

English Coach Features Auburn Line

THE Auburn Automobile Co. is showing six complete cars, three on each of its two chassis models. The three cars on the 43 chassis model are a special sedan, a special phaeton and an English coach, while the three on the 63 chassis model are a four-door brougham, a sport sedan and a special touring car. The feature of the exhibit is the English coach. This has a carved rear quarter entirely of metal and the roof extended beyond this windshield and forms a visor. The under surface of this visor is made of Pullman gauze and there is a ventilator above the windshield which can be operated from inside the driver's compartment. The window regulators are of the railroad car type. Balloon tires and disk wheels are standard on

this model. Four-wheel brakes are offered as an extra on all Auburn models at \$135, while balloon tires are furnished instead of the regular cord tires at an additional charge of \$125 on the small and \$150 on the large car, this including five tires.

Auburn has adopted a new policy of selling all cars completely equipped. The new equipment not furnished previously includes motometer combined with bar type radiator cap, rear vision mirror, automatic windshield cleaner, combined stop and tail light, extra tire and tire cover, disk wheels, four scuff plates, etc. The radiator shells are now nickel plated.

Taxicabs

IN the southwest corner of the Armory there are grouped the exhibits of seven manufacturers of taxicabs. By name these products are the Mogul-Checker, Dodge, Pennant, Yellow-Cab, Rauch-Lang and Premier. In method of display these makers of cabs for public use are following the orthodox lines of passenger car exhibition at automobile shows and most of them include besides complete vehicles, chassis, showing that in the main features of design there have been no radical departures. All of these models are fitted with four cylinder engines. There are no evidences that the four-wheel brake epidemic has obtained a foothold in this field but there is one case of balloon tires which is to be found in the exhibit of the Yellow Cab Co.

Three New Bodies Feature Buick Exhibit

THREE new bodies on the Buick six-cylinder chassis are exhibited for the first time, these being a town car at \$2795, a limousine \$2385 and a country club special \$1945. All three of the bodies are fitted to the 128 in. wheel-base chassis. The town car is finished in bright green on the door panels and rear quarters. The wheels are also finished in the same shade of green, all of the other paint work on the car being in black.

The country club model is a coupe type and one of the conveniences to be noted in the body design is the large

storage space, accessible from the rear deck and from a door on either side. The compartment extends clear across the car just back of the seat and ample provision is made to take articles such as a golf bag and sticks. The doors are provided with locks and the same key that locks the car doors also locks the locker doors. The country club model is finished in a pleasing gray with red wire wheels and black trimmings and running gear. All three of the new models have black moldings with orange striping.

The limousine resembles a Berline in general construction. It seats seven passengers and is practically the same as the seven-passenger sedan except for the glass partition which separates the two compartments.

Moon Features Its \$995 Car

MOON is showing its new six selling for \$995. The new car has Continental engine, Ross cam and lever steering gear and hydraulic four-wheel brakes as extra equipment. The five-passenger touring car on exhibition is finished in marine blue with a hair-line white stripe and is upholstered in spanish leather. The four-wheel brakes sell for \$100 and balloon tires 30x5 in. may be had for \$125 extra.

Flint Shows 4-Wheel Brakes

FLINT is showing for the first time its four wheel brake equipment. These are of mechanical type designed by the Durant engineering organization. The brakes are optional equipment at \$50 extra. They are internal expanding type operating against 14 in. drums.

The exhibits include a five passenger phaeton, four passenger sport and five passenger sedan. With the exception of the four wheel brakes no changes have been made in the car.

Federal Knight Express

ANEW $\frac{3}{4}$ ton truck powered with a standard Willys-Knight engine was shown at the Commodore by the Federal Motor Truck Co., Detroit. This model is known as the Federal Knight Express. It is fitted with 32x4½ in. pneumatics on all four wheels and is designed for fast delivery work.

DEMONSTRATION ON SALES PRINCIPLE

When scores of Ford dealers from all over southeastern Iowa gathered at Mount Pleasant recently for the annual sales conference, the Des Moines representative used a novel stunt to impress upon them the axiom that "the more calls made, the more sales made."

A baby doll rack was set up, each doll representing a Ford prospect. Each ball thrown was a "call on a prospect" and by this demonstration the old law of averages was shown true—the more balls thrown, the more babies fell.

New Motor Car Fitments and Shop Equipment at New York Show

Accessories Have Strong Leaning Towards Making Cars More Comfortable and Safer to Operate. Much Apparatus for Automotive Shop in Evidence

SECOND only to the car exhibits was the great variety of accessories and shop equipment at the New York show. The items shown for passenger cars this year seemed to be of much more practical value and there was little of the sensational and patent medicine variety of apparatus to catch the unsuspecting motorist.

Devices to make the cars more comfortable, such as shock absorbers were quite numerous and the newer ones along this line are mentioned in the following descriptions. With the vast strides made in the enclosed car we find an increasing tendency to such accessories as heaters, spot lights to be mounted on the inside of the windshield, visors, and the hundred and one things which go to make up the appointments of the interiors.

Shop equipment, new and old, was well presented. There is an ever-increasing tendency at the shows to show shop machinery and tools in action. This gives the spectator a chance to see the apparatus exactly as it will operate under actual working conditions and has resulted in better sales. The equipment also is exhibited much more attractively.

The newer things at the New York show are described below. This list, of course, does not include all the new things at the show. Most of the latter have been described in these columns from time to time.

LOCKWEL STEERING WHEEL

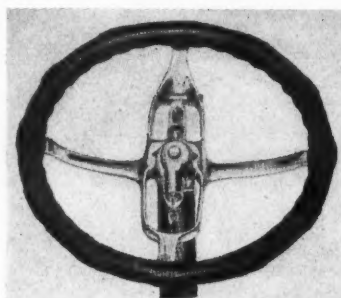
A tilting and locking steering wheel with trigger lock which requires a key only when unlocking. The center head is made of case-hardened steel and a deep key-way insures positive leverage while wheel is unlocked and when lock is snapped into place the wheel cannot be engaged with post until key is inserted and mechanism unlocked. The wheel is of standard 17 in. diameter and the spider is made in one piece of highly polished aluminum. The Rollaway Motor Co., Toledo, Ohio. Price, \$15 for Ford size.

IMPERIAL MODEL B VISOR

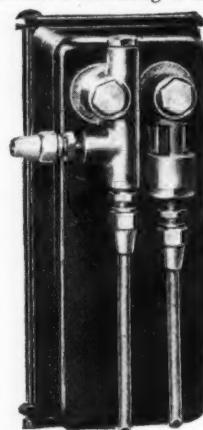
The curved forepart of this visor is made of Pyrolin. The rest of the visor is made of aluminum with black and green enamel. The visor is attached with a simple bracket with slotted sides to allow adjustments for a windshield cleaner. Imperial Utilities Company, Paterson, N. J. Price, \$7.50.

SENTREE RADIATOR CAP CONDENSER

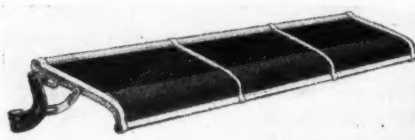
A device for indicating engine overheating. It consists of a chamber superimposed by a cap on a plunger. When



Lockwell Steering Wheel



M. I. C. Oil Purifying System



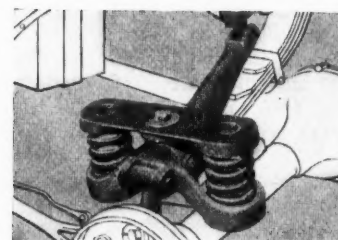
Imperial Model B Visor



Loxrite radiator cap



Sentree Radiator Cap Condenser



Dreadnaut Equalizer for Ford Sedan

vapor rises from the water cooling system it passes into the chamber, where it is cooled by contact with the outer surface and returns in a liquid state in the cooling system. In case of overheating, the increased pressure raises the piston, which lifts the cap and flashes a red signal. In the case of greater heat or greater pressure the piston is sent higher and the compressed air or vapor rushes through an opening and blows a whistle. Alert Alarm Co., 609 North La Salle street, Chicago. Price, \$8.50.

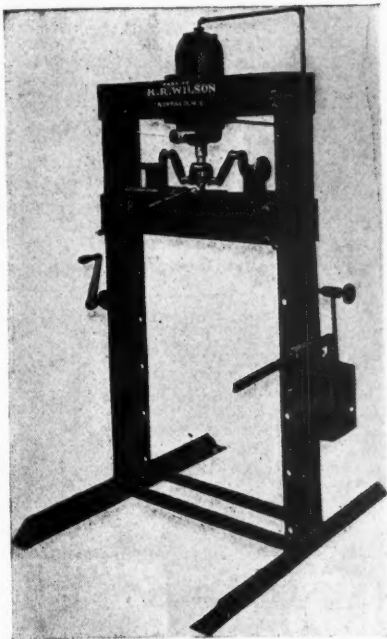
M. I. C. OIL PURIFYING SYSTEM

A system designed to remove all solid contaminations from crankcase oil and to operate in connection with an oil pump. The apparatus is made up of eight filtering elements placed within an oil-tight rectangular case of sheet metal. Each element is in the form of a container of fibrous material within which is a drainage element consisting of two

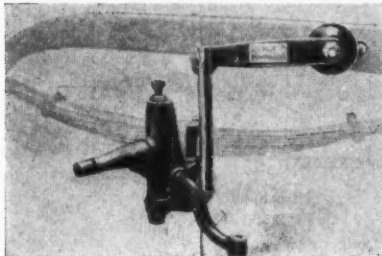
opposed perforated sheet metal leaves. The drainage elements deliver the filtered oil. The filter unit is held in position on the forward part of the dash by means of a mounting bracket into which it slips sideways. This purifier is standard equipment on the new Chrysler. Motor Improvements, Inc., Fisk Building, Broadway, New York City.

DREADNAUT EQUALIZER FOR FORD SEDANS

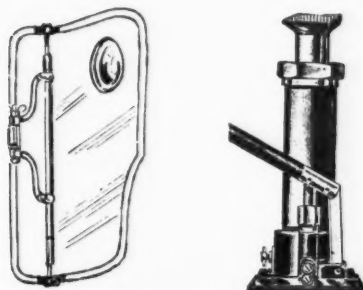
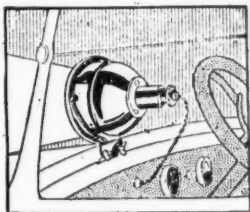
A coil spring type shock absorber, the front unit having one coil and the rear units having two coils each. Rebound is checked by down pull of the arm on the body. Side play is controlled by radius link connecting equalizer arm to leaf spring shackle. This device is adjusted to all loads by turning an adjusting bolt which regulates the spring tension. Auto Specialties Mfg. Co., St. Joseph, Mich.



H. R. W. hydraulic arbor press



Super Shock Absorber

Jassen Wind Deflectors
Everready Hydraulic Jack

Inshield Eight Driving Light



Kingston Standard Truck Governor



Balcrank Lubricating Gun



Ford Brake Lever Extension

LOXRITE RADIATOR CAP

A thief-proof cap which is locked to the radiator and secures the meter to the cap. When the catch is released and monogram plate dropped the locking plug is exposed. The plug is made of brass and in its body is a shouldered gravity pin. When plug is inserted into cap and turned until arrow points downward, gravity pin slips into body of cap and cannot be removed without turning upside down. To fill the radiator with water the catch is pulled. The monogram shield is hinged at the bottom and fitted with a snap catch at the top. Wolverine Metal Specialties Co., Grand Rapids, Mich. Price, \$7.

INSHIELD EIGHT DRIVING LIGHT

An inside-the-windshield light made of brass and finished in nickel or black enamel. It fastens to the windshield frame and is adjustable to any angle. The diameter of the light is 4½ in. Although the light is placed against the windshield the glass remains uncut and the light can be detached quickly and used as a trouble light. The Inshield Products Co., Toledo, Ohio. Price, \$7.50.

FORD BRAKE LEVER EXTENSION

A lever extension which clamps over the handle of the regular brake lever. The handle proper is hinged so that a downward pressure releases the ratchet while an upward lift throws the handle

back for easy egress from the driver's side. The device is made of heavily enameled steel with handle of polished aluminum. The Rollaway Motor Co., Toledo, Ohio. Price, \$2.50.

SUPER SHOCK ABSORBER

A shock absorber of the friction cone type which checks spring action in both directions and which requires no adjustment or lubrication. The housing comprises two pressed steel members which are secured together by riveting. One of them is cup-shaped and serves as one member of the friction device. The friction members are pressed together by a steel spring of volute form, which bears against a fiber washer at its small end. When in the free state this spring is more than twice as long as when compressed in the housing, and any slight extension due to wear of the fiber washer will not alter its pressure perceptibly. The housing is filled with non-fluid oil which insures lubrication of the single bearing of the device and is claimed to eliminate practically all wear on the friction surfaces. The Super Shock Absorber Co., Inc., 37 Fairmount avenue, Jersey City, N. J.

JASSEN WIND DEFLECTORS

These double plate glass wind deflectors are held by nickel plated brass brackets. A shock absorber is concealed in the tubular bar that is part of the bracket. A heavy piano wire spring is employed, strong enough to hold the glass firmly in the bracket, yet limber enough to absorb all shocks and jilting. A rear view mirror is included in the glass. It is a 3 in. diminishing mirror on both sides and is adjustable to any angle regardless of the position of the deflector. The mirror is held in position by a steel spring. Jassen Wind Deflector Co., Inc., 143 Broadway, Brooklyn, N. Y.

EVERREADY HYDRAULIC JACK

This jack has a reservoir around the sides of the barrel from which oil is drawn and pumped into the central chamber. Oil is prevented from returning to the reservoir by means of ball check valves. The height of the jack when lowered is 10 in., and a rise of 5¼ in. is given. It has a capacity of 2 tons and weighs 9 lbs. A truck model is also made, which sells for \$30 and has capacity of 10 tons. Everready Jack Co., Times Building, New York City. Price, \$12 for passenger car models.

BALCRANK LUBRICATING GUN

A lubricating gun which handles either oil or heavy grease and may be used as a pump gun or for high pressure, and is changed from one to the other in a few seconds. The heavy, solid brass barrel is filled by the vacuum created by pulling up the handle. The nozzle equipment includes an adjustable tip which can be used for filling the transmission or differential or for spraying oil or gaso-

line. The nozzle equipment is 65 cents extra. The Cincinnati Ball Crank Co., Cincinnati, Ohio. Price, \$3.

KINGSTON STANDARD TRUCK GOVERNOR

The Kingston governor is regulated by the speed of the truck itself, inasmuch as it is regulated by wheel speed and not by engine speed. Thus the full power of the engine can be utilized until such time as the revolution of the truck wheel attains a speed to bring the governor into action. The device attaches to the intake manifold and operates by cable from the truck wheel. Bryne, Kingston & Co., Kokomo, Ind. Price, \$25.

MACK WATER PUMP FOR FORDS

The principal feature of this Ford impeller pump is its low mounting with relation to the engine. It is held by a flanged bracket at its center and by hose connections at either end. The impeller shaft is rotated by the regular Ford fan belt, operating through a pulley, and is supported by a 3½ in. bearing. A large water chamber back of the impellers insures constant circulation and a drain channel allows all water to drain out of pump, should radiator be emptied. The Waco Co., 109 Market street, Harrisburg, Pa. Price, \$5.50.

WOLVERINE HIGHWAY BUMPER

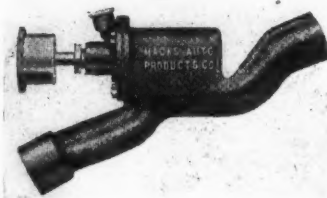
A double bar bumper having a rear spring bar. The two parallel bars are bent over at the ends and are fastened to the back bar by means of two clamps. This model is manufactured in three sizes and is supplied in black or nickel finish. Wolverine Bumper & Specialty Co., Grand Rapids, Mich. Prices, \$18 to \$25.

K-W GLARE SHIELD

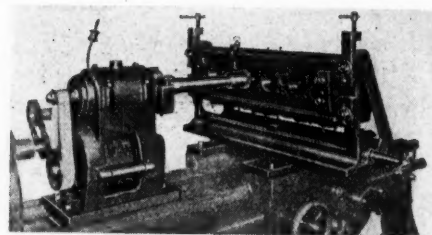
This device consists of an irregular shaped piece of Pyrolin held by an arm and bracket and is attached to the inside of the windshield. The Pyrolin is placed in a position parallel with the windshield, the right edge being on a line with the center of the steering wheel. The driver has a clear vision at all times on the right hand side of the road by looking to the right of the shield, and 200 to 300 feet ahead by looking under it. As an auto approaches the lines of the oncoming headlight glare follow the exact angle of the Pyrolin, thus acting as a shield at all times. K-W Glare Shield Co. of Massachusetts, Inc., 46 Cornhill, Boston, Mass. Price, \$3.

HASSLER SHOCK ABSORBER FOR CHEVROLET

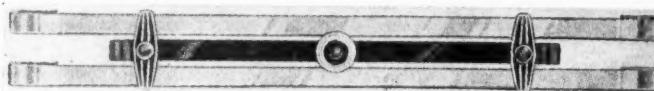
A friction type, center control shock absorber which is clamped in place on the drive shaft housing and is connected to a cross member of the frame under the floor boards. This arrangement distributes the shock absorbing action from the single unit to the front as well as the rear end of the car. This device is self-lubricating and is completely enclosed so that it is protected from water and dirt. No adjustments are necessary after in-



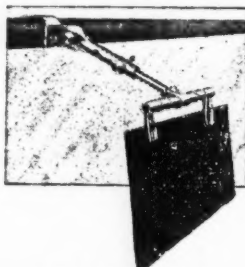
Mack Water Pump for Fords



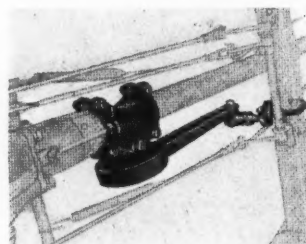
Trubloc Cylinder Grinding Attachment



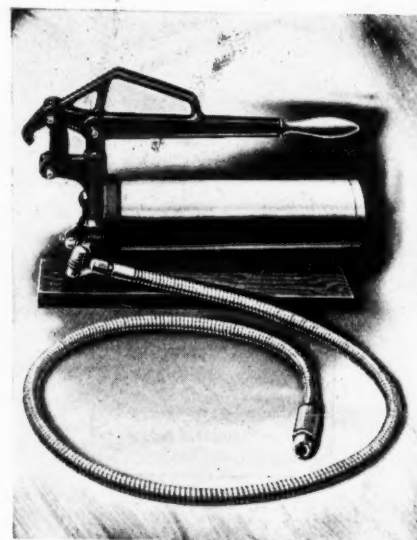
Wolverine Highway Bumper



K-W Glare Shield



Hassler Shock Absorber for Chevrolet



Alemite Little Giant grease compressor

stallation. Robert H. Hassler, Inc., Indianapolis.

TRUBLOC CYLINDER GRINDING ATTACHMENT

Designed for small machine shops, this attachment can be fitted to any engine lathe with 16 in. or larger swing. Power with change of speeds for revolving the eccentric arm on the grinder is taken direct from the lathe headstock. The lathe carriage holding the block angle plate feeds the work back and forth at any desired speed. A built-in motor drives the spindle at 5,600 r.p.m. Horizontal and vertical adjustments for locating the work are self-contained in the block holder, which accommodates cylinder castings up to 33 in. in length. The machine grinds four, six and eight cylinders and will grind holes up to 7 in. in diameter and 14 in. deep. Irvington Machine Co., 297 Badger avenue, Newark, N. J. Price, \$550.

KINGSTON CAR HEATER

These heaters are designed for use on Dodge, Overland, Studebaker, Essex and Chevrolet. Air is warmed by the exhaust manifold and conducted to the car through the heater. The heater may be closed by a touch of the foot, permitting the heated air to pass out beneath the

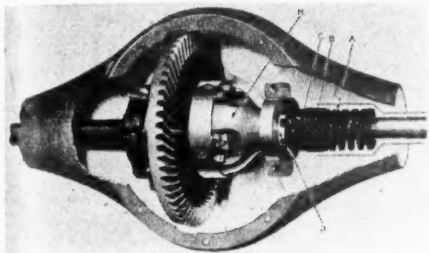
car. The Ford model heater has been improved and sells for \$3.75. Kokomo Electric Co., Kokomo, Ind. Price, \$5 and \$7.50.

ALEMITE LITTLE GIANT GREASE COMPRESSOR

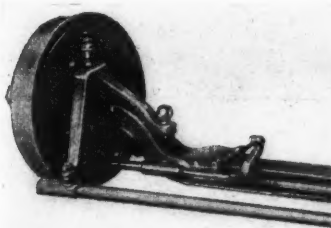
Designed for shop equipment and known as model H-17, this new hand-operated compressor has a 17 lb. lubricant capacity. The cylinder containing the grease is mounted horizontally on a rolling base. Pressure is obtained by means of a booster pump which runs into the piston. Lifting the hand lever creates a vacuum and draws lubricant from the cylinder into the booster pump, from which it is ejected by a downward movement of the lever. The dimensions of this compressor are: 19¼ in. high, 27 in. long and 8½ in. wide.

ALEMITE LITTLE GIANT GREASE COMPRESSOR

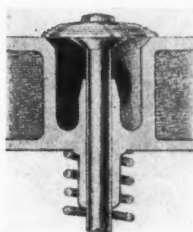
This unit is known as model H-5 and has a 5 lb. lubricant capacity. Operation is identical to the model H-17 and the principal difference is in the size of the outfits. In this model the base is not rolling and the dimensions are: 13½ in. high, 17 in. long and 5 in. wide. Bassick Mfg. Co., 2650 North Crawford street, Chicago.



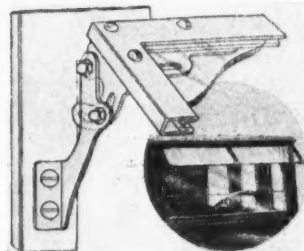
Barty Control Parts



U. S. Front Wheel Brake Axle



Boyle Valves



Brude Windshield Visor

plates flatten out with a cushion effect which causes a slight radial movement upon the seat producing a grinding action which is said to keep the seat clean. Boyle Valve Co., 2101 Larrabee Street, Chicago.

BRUDE WINDSHIELD VISOR

This visor features the use of Houze transparent colored glass, which is supplied in amber, blue, green and char-treuse, the latter being an olive toned smoke color. The visor is equipped with a combination open and closed car attachment, post clamps are used for open car installation and screws for closed cars. Nickel plated attachments are furnished for \$2.50 extra. T. M. Brude Co., 326 West Madison street, Chicago. Price, \$12.50.

CARR POWER SERVICE TANK

This tank is designed for use in service stations where greasing operations are carried out on a large scale. Lubricant is held in the upper part of a chamber which holds 15 lb. at a time. Oil used for transmitting pressure is stored in the lower half of the chamber. The $\frac{1}{2}$ hp. motor supplies power operating through a reduction gear to a double plunger pump which forces oil through a single plunger pump. The tank can be operated at any desired pressure and an electric cutoff, cuts in and off to maintain this pressure. The device which rolls on wheels, weighs about 400 lb. and sells for \$500 complete with hose and grease gun. Carr Fastener Co., 31 Ames Street, Boston. Price, \$500.

K. R. W. HYDRAULIC ARBOR PRESS

The K. R. W. press is designed to do all Ford, Fordson and Lincoln arbor press work. While capable of exerting great power, it is also easily controlled. The hydraulic pressure can be controlled to .001 in. The table is self-lifting, being operated by the turn of a crank. Side bars are made of 7 in. channel steel and all holes are drilled, not punched. The press can be used for such operations as pressing on a propeller shaft roller bearing sleeve, straightening a crankshaft, and taking off axle pinion gears. K. R. Wilson, 10-16 Lock street, Buffalo, N. Y. Price, \$135.

McCLURE ELECTRICALLY OPERATED OIL CUPS

These cups are designed to replace the regular style of oil cup. Each cup contains a small piston or ejector operated by a current from the battery, through ammeter and switch, along a single wire connected to the cups. A slight electrical impulse operates the small electric oil pump and a measured quantity of oil is forced into the bearing each time the control button is pressed. The control is mounted on the dash. Each oil cup holds about sixty charges of oil, sufficient for 5,000 miles of travel. McClure Electrically Operated Oil Cups, 215 Amsterdam avenue, New York City.



H-17 Alemite Little Giant grease compressor

BARTY CONTROL PARTS

Barty Control Parts are intended to prevent the spinning of rear wheels and act as a semi-differential lock. The parts consist of an insert, sliding clutch and spring. The insert always revolves at the speed of the differential case to which it is joined by projections, and the sliding clutch always revolves at the speed of the splined wheel shaft, on which it is loosely mounted so that it will slide. On the ends of these two parts are V-shaped clutch teeth having faces so shaped that they have perfect surface contact when closed and while opening. The coil spring normally holds the parts with their clutch teeth in mesh. Resistance to their separation is only partly that of the spring pressure, but principally that of the friction between the splines of the wheel shaft and the sliding clutch. Very little power is needed to separate the clutch teeth because the force required to do the work acts only for a very short time, and, when the ends of the teeth of one part is sliding across the ends of the teeth of the other part, differential action is unrestrained. It is claimed that there is no appreciable loss of speed noticeable

even when a car is allowed to coast around a corner. Barty Axle Corp., Syracuse, N. Y.

U. S. FRONT WHEEL BRAKE AXLE

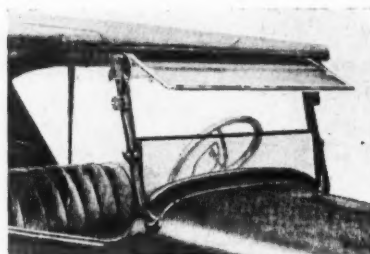
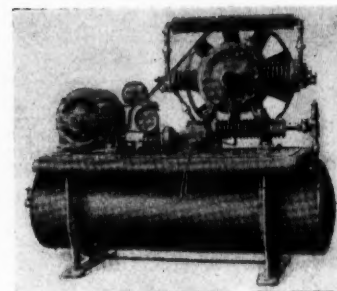
A front brake axle which can be hooked up to and equalized with any conventional rear axle or transmission brake. The brakes are operated by means of a shaft carried on the axle center which operates a vertical plunger through the center of the steering knuckle pin by means of a rocker arm. The operating shaft is free to move longitudinally, giving equalized pressure on both side. It can be adjusted to any desired stop limit. The axle sells for \$185 for medium weight cars and \$235 for heavy vehicles. U. S. Axle Co., Pottstown, Pa.

BOYLE VALVES

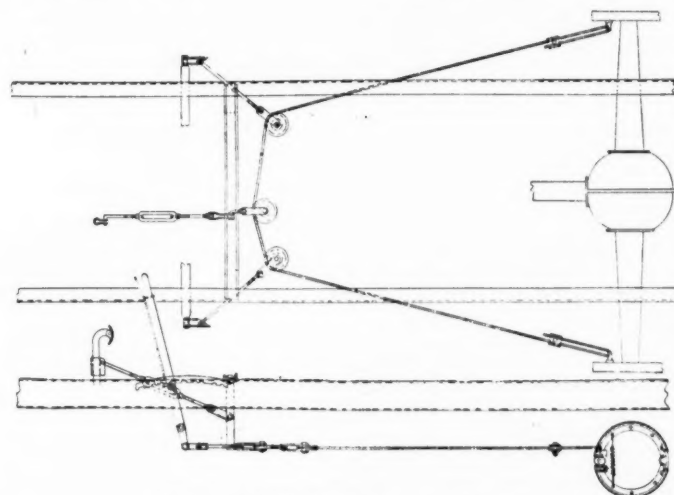
The head of the Boyle valve is made of several plates each slightly concave and flexible and instead of seating in the regular valve seat it rests on the top of the cylinder block. When drawn against the seat by the action of the spring these

MASTER METAL VISOR

This visor is made of one piece of cold rolled sheet steel and is finished in green and baked. The trimmed ends are polished aluminum strips. The visor has a gutter to take the rain off at the side. The bracket will fit either open or closed cars and can be adjusted to fit practically all cars. A turn of a wing nut allows the visor to be moved up or down to suit the vision of the driver. Automotive Specialty Corp., 311 West 59th street, New York City. Price, \$3.50 complete.

*Master Metal Visor**Gardner, Junior, Monarch Compressor***STRINGER CABLE BRAKE SYSTEM FOR FORDS**

A brake system which enables the rear wheel brakes to be applied simultaneously with the foot brake. Application of the emergency brake applies the rear wheel brake only. Two pressed steel brake bands with linings are supplied for replacement. Pulleys are provided with brass bushings and a galvanized aircraft cable is employed. The connection between the brake system and the foot brake pedal is provided with a turnbuckle for simple adjustment. The device which is supplied complete, weighs 10 lb. and can be installed without drilling of holes. Stringer Cable Brake Co., Pottstown, Pa. Price \$15 for cars, \$20 for trucks.

*Stringer Cable Brake System for Fords***DEFENDER TRI-BAR BUMPER**

This bumper is designed with three main bumping bars. The two outer bars take up the lighter blows and spring back into position. The third or back bar is rigid and comes into action under heavy impact. Heavy coil springs at each end serve as flexible connections. The two outer bars are finished in nickel and the back bar is finished in black enamel. New York Wire & Spring Co., Hoboken, N. J. Price, \$17.

*Defender Tri-Bar Bumper***HOE WRENCH**

This wrench has a drop forged handle and jaw which is attached to the latter by two connecting links forming a toggle joint. The connecting links are also connected to each other by a small spiral spring. Hoe Corp., Poughkeepsie, N. Y.

OIL CONTROL WEL-EVER PISTON RING

Features of this ring are the knife edge lip with groove for gathering oil and outlet passage at bottom of ring to allow oil to pass through holes provided for in back of ring groove in piston. This construction allows excess oil to be forced back into the crankcases.

Wel-Ever Piston Ring Co., Toledo, Ohio.

ROUGHNECK FORD BAND LINING

A fabric brake lining chemically treated to prevent grabbing or gripping and to remain soft and pliable. Perfection Valve Co., 1011 Lafayette avenue, West, Detroit. Price, \$2.25 a set.

DAWZ DIARY

JAN. 17—Well the grate New York show is over but i dont see as it makes no differents with me. I spose if i was a salesman in one of them big city places they would of sent me down thare and paid my expenses much as a hundred bucks maybe, so as i could find out all they is to no about all them new cars so as i would no how to nock all the other ones wich i dont sell.

If i was a dealer you bet your neck i would go eather to New York or Chicago. Them little shows in small towns aint so good for a fellow wich is snooping around becuz they aint none of them cut away chassises wich a guy can see all the

works and find out how to fixe them when they get busted and also they aint so many acesorys wich a fellow can get next to me thinking acesorys is hot stuff when a fellow can make more money in a few minits selling something than he can make in haf a day fixing something or mabe a hole day.

If i wasn't tryin to save 10 dollars a weak i would by a ticket to Chicago and take in the big show mabe i will anyhow or if we was to devide the expenses me and Art and let him go that might be beter him being betern me about snooping around.

I guess we beter wate til next year though me thinking we mightent get started and wich being the case the boss would get all the benefit of what we find out and with him not caring enough to

go or send someone why should we worry. Gosh but i am hard up without them 10 bucks a weak but its got to be done thats all.

MOTORS REPLACE BURROS IN PERU

THE touring car and auto truck are rapidly replacing the burro and pack mule which have for centuries carried supplies from the sea coast up, and products of the Sierra down, reducing the cost of transportation by more than half," says the West Coast Leader, Lima, Peru. The recently improved Trujillo-Quiruvilca Highway is developing the region between these two cities in mining and agriculture.

SEVEN OVERALLED ELECTRICIANS



Seven young 'lectricians
Opened seven stations.
But one who couldn't keep a book
Failed to draw his rations.



Six bright 'lectricians?
Nope! Most of 'em are fools!
Like he who wouldn't charge
for wear
And tear upon his tools.



Five new 'lectricians
Played hide and seek with fate.
One refused to advertise
—His children seldom ate!



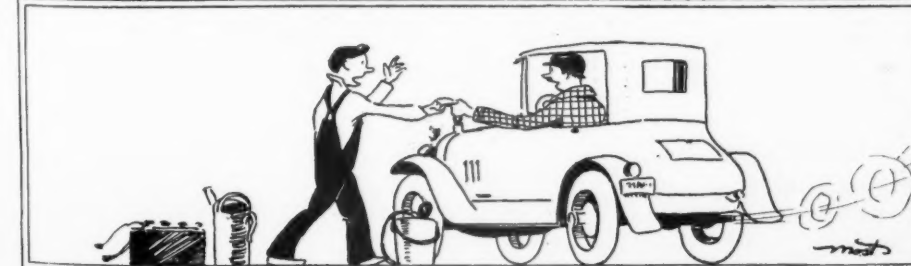
Four green 'lectricians;
One thought 'twould be as well
To save no wiring diagrams.
(He's in a padded cell).



Three grimed 'lectricians;
One made no charge for water.
(The county poorhouse shelters now
His little orphaned daughter.)



Two tired 'lectricians;
One claimed that cadmium
To test a cell was poppycock.
That put him on the bum.



One rich 'lectrician
Is busy every day.
He spent his jack for instruments
Used brains, and made folks pay!

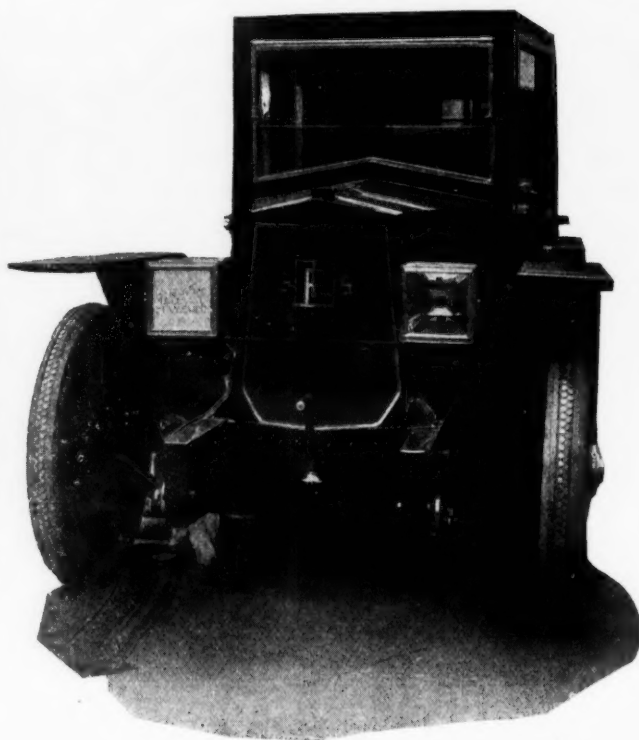
MOTOR AGE'S PICTURE PAGES



Near Mattewan, Pa. hunters report fine luck. Heavily wooded districts nearby gave up this excellent evidence to these motor hunters

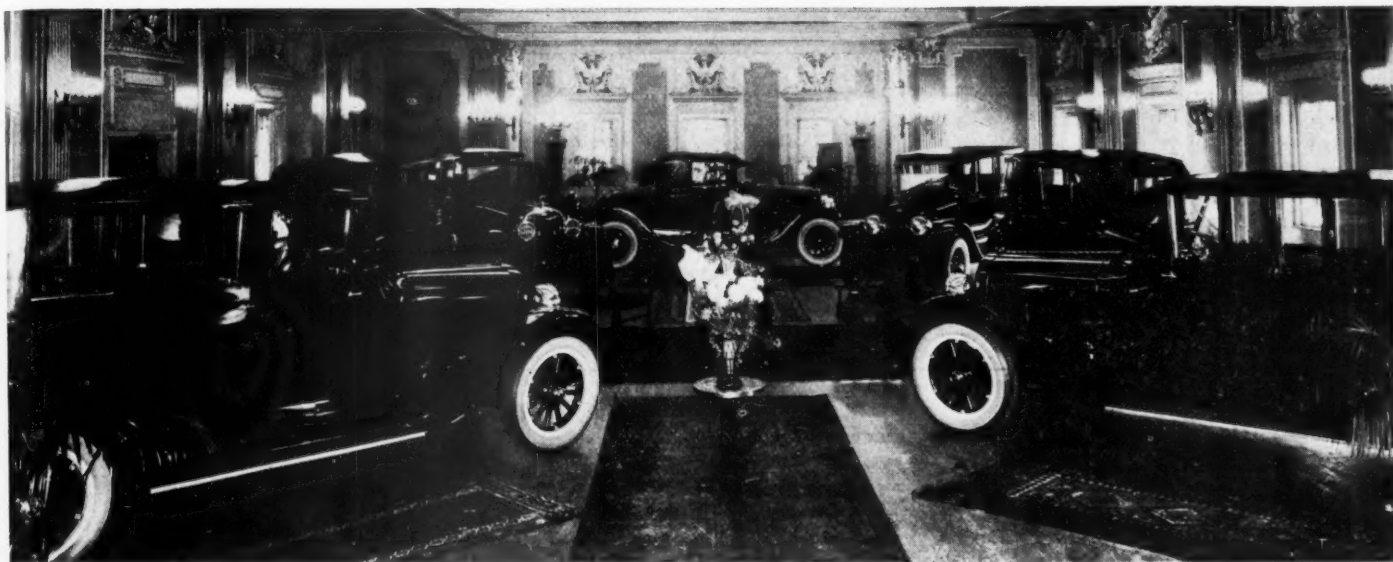


Bradley calls this a "square deal" on a Panhard chassis but it looks to us as if some Paris designer had turned cubist



The Stutz distributor at Erie, Pa., sounded an appeal to sportsmen with this window display, featuring a forest camp

OF AUTOMOTIVE INTEREST



This display of Lincoln cars in the Rome Hotel, Omaha, created quite a stir of enthusiasm as it was the first of its kind used here



Former street car men in Tokio are now being trained to handle trucks. Their teachers say that they will be trained in a month and a half



The gasoline tractor lends itself to a number of uses. Here is one in the Philippine Islands on the Experimental Pineapple Farms. A special kind of paper is spread over the young plants to prevent the growth of weeds and to retain moisture in the soil





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A Good Sign

EVERYWHERE you turn these days, among motor car dealers, you hear discussion of the used car "problem." There cannot be the slightest doubt but that hundreds and thousands of dealers are determined to solve this problem and solve it quick. There seems to be a very general realization that the used car department is the leaky connection through which the profits have leaked.

The visionary plans of years ago have been sifted out until only two plans in general are much discussed. It is true that there are variations of these plans, but the principle remains the same. Hundreds of communities are going to experiment with a plan and every experiment will do some good.

Failures are sometimes as profitable as successes, in that they point the way to success. Just as soon as hundreds of smart dealers get to studying this used car thing in earnest, we are going to have some real results. The success of the used car plans is up to the backers of these plans. If they are right, success will not be long in coming to them. If they are wrong, they will die, just as other wrong things die.

The used car is an economic problem and as such it will be solved in an economic manner. Right always comes out in the end. A wrong economic venture has no chance in the long run. It is too expensive to maintain an idea that is fundamentally wrong. In the multitude of coun-

sel there is wisdom and now that we have the multitude of counsel earnestly centered on the used cars, instead of just a few voices in the wilderness, we expect a solution.

There is so much value in the used cars that there must be some way of handling them that will be economic to the seller, the dealer and the buyer. We look for local successes and failures under the plans during the next few months and perhaps years, but we are nearing the solution.



What is your association doing?



Safety

NEWSPAPERS throughout the United States have given considerable space in recent weeks to the number of deaths in their communities in 1923 due to automobile accidents. As compared with 1922, some of the large cities have shown a reduction in spite of increasing population and more motor vehicles on the streets. In other cities the number of fatalities has increased and sometimes the entire automotive industry has been held up to the public as a ruthless killer. As long as there is any avoidable killing and injuring of human beings by motor vehicles there is a problem which the leaders of the automotive industry should recognize as their own and be the first to attack with determination.

The National Automobile Chamber of Commerce has recognized this problem and shouldered its share of responsibility. Its new committee dealing with safety and highways is composed of some of the most distinguished men in the industry. This committee already has shown a courageous determination to attack the problem aggressively and intelligently. Its recent meeting in New York with officials of the large automobile associations was a step toward co-operation in nation-wide safety campaigns.

With the manufacturing part of the automobile industry taking part in the national safety movement it would be well for automobile dealers and distributors everywhere to put their shoulders to the wheel and do all they can to improve conditions in their own communities. They do not want the motor car to become known as an instrument of death and destruction in their own communities. They know that properly handled the automobile is not the evil thing it is sometimes pictured, but a blessing that brings joy and happiness to millions. Let us make this a year of safer driving.



The used car is a buying problem.



Force of Habit

UP to December 31, there was not a single day this winter when it was positively dangerous to park a car out of doors a reasonable time in Chicago. And yet hundreds of cars were long since placed in winter quarters. The dead storage does not

appear to be equal to previous years, but a considerable portion of it is occupied.

This merely illustrates the force of habit as connected with the motor car. Years ago it was established as a custom to lay up the car in November and so this season, an exceptional one, the habit was followed.

Also it was apparent, to even a casual observer, this year that the piano dealers were much more enthusiastic about the Christmas market than the automobile dealer. It is quite true that some automobile dealers had quite remarkable holiday windows but the average of enthusiasm was not as high as in the older mercantile business.

Again we must say it is the force of habit that is working against the motor car. For a long period the Christmas holidays have been a big delivery period for piano dealers. With them it is a trade-boosting force of habit. With motor car dealers it is not.

Why should the automotive industry let force of habit work against business?



Fight the automotive "luxury" tax.



Income Tax and Cars

THE warm weather during the fall and the very general feeling that the clothing industry has not adjusted prices on wearing apparel since the war boost, has apparently affected the nerves of our friends in the clothing industry. During last few weeks there have been several attacks from the makers of clothing on the automotive industry. We have no disposition to take up any argument as to the relative merit of extra suits of clothes or overcoats versus owning an automobile. The people who support the industries already have definitely answered that question.

The only thing that interests us in these statements is the very obvious unfair use of statistics. One of these articles that attack the common sense of the great buying public calls attention to the fact that in Indiana there are 424,810 passenger cars and only 89,563 persons filing income tax returns indicating an income of \$40 a week or more. Granted that these figures are correct, we would like to ask why the comparison was not made with the number of church members or members of the Elks lodge? There would be just as much relation between the number of automobiles and these two classes, as there is with income tax payers.

It is or should be a well known fact by this time that the only people who make income tax returns with any degree of regularity or unanimity are salaried people and Indiana is not as heavy on this class as it is in small business and professional people and farmers. Three classes who do not, as a rule, make income tax returns and who are very strongly motor car owners.

If the clothing statisticians would go a bit farther and ascertain just how many people there are in Indiana who are enabled to earn enough money to buy clothes, because of the automobile, they would be doing themselves a better service. Then they could figure how many farmers, because of the automobile, are able to buy any clothes except overalls. After doing this, they might figure how many people are buying \$50 suits

instead of the "go upstairs and save \$10" kind, because of the automobile.

As we said before, we have not the slightest idea of saying anything about clothing or the necessity of clothing, or the proper price of clothing or anything of that kind. Clothing is often classified in the essential industries, along with transportation and we believe that is right.

To blame the faults of the warm fall and the prejudice of a large mass of people on what they think are high prices on the motor car, is not right. Especially when perfectly good figures must be juggled to do it.

We merely want to say to the automotive merchants that you are in an essential and economic business and the reason for your present prosperity is that you cannot fool all of the people all of the time. As long as the automotive industry adjusts its prices and profits as they have done in the last few years, you need have no fear of juggled statistics.

When the weather gets very cold and stays so for several days running, the people will not buy motor cars but they will probably clean up some of the surplus stocks of woollens. When that period comes, we hope our automotive friends will see things with an adequate philosophy not to attack any other industry.



Make traffic safe in 1924.



Collection Letters

STEREOTYPED collection letters, like all other form letters that are run off at random and look as much like original copies as the painting of "Washington Crossing the Delaware" looks like what really happened, are not going to get results. Why? Because form letters that are too obviously form letters are thrown into the waste basket without a thought by the receiver.

He thinks, "Oh, that's the same old bunk that every one is getting. They're just trying to bluff me. When they run out of one series, they'll send another and none of them mean a thing." Form letter collection letters at once have the stamp of being just that.

If you would get results from your collection letters, send them as though they were the only ones of that kind you ever had to send. Give the reader reason to believe that he is the only one of all your customers who is delinquent. The stereotyped form letter will lead him to believe that everyone in the world owes you money. The way to avoid this is to type each letter individually, starting off with a direct salutation, using the man's name and address and appealing to him that way.

The letter must be as different as if it were a personal letter to a friend. Letters that are individually written, or if they are individually typed form letters, are always surer to get results because the reader at once believes he is the only one addressed and is as greatly impressed as if some person were talking to him in the privacy of his home instead of talking to him and a thousand others from a public platform.

Manufacturers to Push Production

Attendance at New York Show May Break Previous Records

Further Stepping Up to Take Place in February; Spring to Start Buying

NEW YORK, Jan. 14—Automobile manufacturers will move production forward this month, based on returns from the New York show, when convincing evidence was given of sustained buying interest on the part of the public. Despite the fact that a New York automobile show, for the first time, was held miles from the center of the city, figures indicate that attendance records at previous shows were broken this year.

The character of the crowds was one of the most promising features of the attendance, ready response being made to the refinements in models, the fact that cars were better than ever before, and the introduction of innovations in mechanical design.

With an increase in production schedules this month, a further stepping up will occur in February, until all plant facilities are utilized. Manufacturers look for high programs in production to continue for the first half of the year, at least, forming their estimates on the general attitude of the public.

The full strength of the buying movement will not be felt until the beginning of spring, but producers feel warranted in operating on a high level to meet the demand at that time. Shipments are being made to dealers in greater volume than in the same period last year, and the part that cannot be absorbed through current sales will be stocked against spring call.

There is also a disposition on the part of manufacturers to warehouse stocks, not only at factory centers but at distributing points, where they can be forwarded without delay when sales demand warrants. Every precaution is being taken by producers toward preventing a shortage of cars in the spring, the heaviest buying period of the year, such as was experienced a year ago. Heavy production now and accumulation of stocks, it is felt, are the two important factors which will act as preventive measures.

The farm market looms as one of the strongest for sales of automobiles this year and manufacturers will devote themselves more aggressively than heretofore in promoting selling campaigns in rural and agricultural districts. While business in those regions held up remarkably well during the past year in view of conditions, it is believed that this year will see more pronounced evidence given by farmers to make purchases.

This will affect trucks as well as automobiles and truck builders are prepared

to meet the improved conditions. Truck building has progressed along conservative channels, stocks of finished vehicles being kept at a minimum and production following the course of actual demand.

Hupp Plans Output of 50,000 Cars in 1924

NEW YORK, Jan. 11—Good selling conditions are practically assured for at least the first six or seven months of 1924, O. C. Hutchinson, general sales manager of Hupp Motor Car Corp., told dealers at the New York show meeting. So much so, he said, that the company is planning on 50,000 production during the year. Sales in 1923 totaled 38,279, and the company was obliged to cancel orders for 7,500 cars, owing to extreme demand when the factory was undergoing changes incidental to new models.

President C. D. Hastings addressed the dealers briefly and the major part of the evening was given over to the showing of a film, "The Reason," which pictured the factory organization and the work that it is doing. Mr. Hutchinson stressed the importance of dealers preparing to meet conditions in the coming year by placing their business on a thoroughly sound basis.

BATTERY MAKERS' ASSOCIATION PROPOSED

NEW YORK, Jan. 12—A meeting of battery manufacturers was held this week under the auspices of the Class Journal and Chilton companies, at which a resolution was adopted calling for the appointment of a committee to consider the formation of an association of battery manufacturers. The committee is made up of D. H. Kelly, vice-president, U. S. Light & Heat Corp., chairman; R. B. Crane, vice-president, the Cooper Corporation; A. R. Campbell, vice-president of the Wright Storage Battery Co., and Chas. A. Englert, vice-president and general manager of the Englert Mfg. Co. This committee will meet in Chicago at the time of the show to consider the basis for the organization of an association of battery makers and the means of effecting it.

SEEK MOTOR LINE

MADISON, Wis., Jan. 14—The Mid-Western Dispatch, Chicago, has opened negotiations with the Association of Commerce of Madison, Wis., and the Union Transfer & Storage Co. of Madison with a view of establishing a permanent motor transport line between Madison and Chicago, similar to its lines between Chicago and Davenport-Rock Island-Moline and Indianapolis. At present the Mid-Western routes one truck from Chicago to reach Madison every Friday morning, with 5 tons of Sunday newspaper supplements. Usually there is no return cargo.

Million Cars and Trucks in First Quarter, Says Erskine

Industry Has Capacity for 5,600,000 Cars in 1924, Studebaker Leader Declares

NEW YORK, Jan. 14—Talking to his thousand or more dealers at the show banquet of the Studebaker Corp., held Thursday night at the Plaza, President A. R. Erskine outlined his policies for 1924, predicting that the first quarter of this year will see a production of a million cars and trucks by the automobile industry.

"The industry has capacity for 5,600,000 cars this year, but I am not going to attempt to estimate the probable production for 1924," he said. "I look, however, for the manufacture of a million cars in the first quarter.

"So far as the Studebaker Corp. itself is concerned, we have more orders for spring delivery on our books right now than we ever had before. We are in position to manufacture from 15,000 to 16,000 cars a month and we look to get Studebaker's share of the business. We are not going to crowd the dealers, but we are going to be in position to meet any and all demands for cars."

Mr. Erskine reported the manufacture of 150,000 cars in 1923, of which number 145,112 were sold, leaving the corporation with 5000 cars on hand at the first of the year to meet the dealers' pressing needs. The 1923 output at factory list without deductions for taxes, etc., represented \$201,000,000.

Company Is Well Prepared to Meet Any Production Demands

The corporation, because of the successful expansion plans, made at a cost of \$15,000,000, is well prepared for any manufacturing demands. It now has an investment of \$51,000,000 in plants, having spent \$37,000,000 on this sort of development since 1916.

Answering the call of Vice-President H. A. Biggs, who acted as toastmaster, Vice-president M. F. Wollering talked production, telling the dealers that if necessary, the Studebaker plants can turn out 180,000 cars a year. He told of the construction of an \$8,000,000 closed body plant and reported that last year 30 per cent of Studebaker production was closed jobs, the division being 50 per cent of the Big Six, 20 per cent on the Special Six and 20 per cent on the Light Six. If necessary, the corporation can make 40 per cent of this year's output closed jobs.

"I won't promise you any changes in construction in the 1924 cars as they now stand, but changes will be made as required," said Mr. Wollering.

Farm Market for 1924 Is Promising

Sloan Predicts at Least as Good a Year in '24 as Last

More Than 800 Dealers and Distributors Make Up Audience at General Motors Meet

NEW YORK, Jan. 10—Confidence in the bright prospects for business in 1924 and a plea for cooperation among dealers in the various General Motors lines were high spots in the speech of Alfred P. Sloane, Jr., President of the General Motors Corp., at the Commodore Hotel last night. More than 800 members of the Eastern dealer organization, including dealers, distributors, sales managers and salesmen attended. Mr. Sloane predicted that 1924 would be at least as good a year as the banner year of 1923. In his plea for cooperation among General Motors dealers, Mr. Sloane expressed the hope that 1924 would show greater effort on the part of dealers to turn over to others handling General Motors products the prospects that they were unable to close on their particular make of cars.

A. B. C. Hardy, president of Olds Motor Works, who made the principal talk of the evening, covered a wide range of subjects in his characteristically aggressive way. He was especially caustic in commenting on the newspaper attitude toward accidents in which motor cars figure and told how the N. A. C. C. is planning an appeal to the newspapers of the country to investigate each accident and establish the blame before attributing it to the motor car and the motor car driver. He pointed out that the motor car dealers have a very important place in the picture and that it is their job to sell the idea of careful driving to their customers.

Mr. Hardy told of the plans and preparations for stepping up production on the new "Six" to 12,000 cars a month by April, with 15,000 a month the goal. The plant will be running twenty-four hours a day within 30 days, Mr. Hardy said.

The speakers of the evening included: Guy H. Peasley, general sales manager, toastmaster; Alfred P. Sloane, Jr., President of General Motors Corp.; Charles S. Mott, vice-president, General Motors Corp.; A. B. C. Hardy, President, Olds Motor Works; Charles S. Carroll, counsel, General Motors Acceptance Corp.; Thomas O'Brien, assistant sales manager; and several Eastern distributors.

RICKENBACKER LUNCHEON

NEW YORK, Jan. 14—At the annual luncheon of the Rickenbacker Motor Car Co., held at the Commodore hotel, Capt. E. V. Rickenbacker announced the completion of arrangements with the Commercial Credit Corp. of Baltimore, Md., and other subsidiary companies, to han-

dle the wholesale and retail financing of Rickenbacker cars. Capt. Rickenbacker also briefly reviewed the successful two years of life so far enjoyed by the company and pointed out that with no indebtedness, the company now has a total of \$1,000,000 surplus in the bank.

Howard L. Wynegar, president of the Commercial Credit Corp., outlined the resources of his companies and the future relationships with the Rickenbacker organizations. Other speeches were made by E. Leroy Pelletier, A. J. Banta, the new sales manager and "Bugs" Baer, well-known humorist.

MORE TAXATION PROPOSED

WASHINGTON, Jan. 10.—Another proposal to tax the users of automobiles has been introduced in the House of Representatives by Congressman S. O. Bland, of Virginia, who has introduced a bill (H. R. 4454) amending the revenue bill of November 23, 1921, which would tax taxicabs, sightseeing cars, and operators of private vehicles who charge fares, the money to be collected in addition to the state taxes and turned over to the Federal Treasury. The measure provides for a \$10 annual tax on each automobile used for hire having a seating capacity of two and not more than seven passengers and \$20 for each such automobile having a seating capacity of more than seven passengers.

CADILLAC ADDS TWO CARS

NEW JERSEY, Jan. 14.—Two closed cars have been added by Cadillac Motor Car Co. to its line, a Victoria coupe at \$3,275 and a seven passenger sedan at \$3,585, which are designed especially to meet requirements of suburban trade. The other coupe and sedan of the line are priced at \$3,875 and \$4,250. The difference in price is represented principally in details of body work and upholstery, no options being offered in interior decoration or paint.

F. C. ZILLMAN RESIGNS

CHICAGO, Jan. 15—F. C. Zillman, who for the last two years has been manager of the Illinois Automotive Trade Association, with headquarters at Peoria, presented his resignation at a meeting today of the board of directors in Chicago. He will join the Phoenix Hosiery Co. of Milwaukee, with which he was connected before taking up the automotive trade association work. Under his management the Illinois association has made steady progress.

PAIGE DEALERS ENTERTAINED

NEW YORK, Jan. 11—Paige-Detroit Motor Car Co., entertained its dealers and staged its New York show meeting in the Hotel Commodore. The evening was given over largely to a cabaret entertainment. President H. M. Jewett was

Manufacturers Look for Big Returns From Rural Districts

Farmer Will Buy Just as Good a Car as He Can Afford, Executives Declare

NEW YORK, Jan. 14—The farm market for 1924 is regarded by manufacturers as promising to take a much larger number of cars in all price classes during the coming year than in the year just closed. Aside from Ford sales, the market in 1923 did not exceed 50 per cent of the demand that had been expected by most manufacturers, leaving a very large market wide open for the coming year.

If farmers are to come out of the low priced car class in large numbers in 1924 is a matter of how prosperous he expects to be, manufacturers declare, and a general feeling is reported from the field for much better conditions. A distinct evidence of this is in the number of dealerships which are being opened up in agricultural districts, many cases being of dealers re-entering business.

The farmer will buy just as good car as he can afford, executives declare, and if he is at all favored by the developments of the year, he will be an important factor in all lines. Plenty of low priced car sales are assured, more than last year by a large number, because of the necessity for some sort of transportation, and with favorable conditions, a much larger market for medium priced and higher priced lines.

Cotton and wheat belts of the country were most disappointing during 1923 for two distinctly opposite reasons. Cotton prices were high but the crop was small. Wheat crops were large but prices low. Small cotton growers have been large buyers of low priced cars. In most other crops the yield was good and prices high, so that entering the new year farmers are in much better condition than a year ago.

By early summer a large buying movement is expected to originate in the farming centers, which will take a large part of the production through the balance of the year. Not much buying is expected before that because despite his generally improved financial condition, it is anticipated the farmer will wait until he can visualize the possibilities of his yield during the year.

In all parts of the country there is reported a movement among farmers, especially the smaller ones, to change over from unsatisfactory crops to those which promise better returns. Districts which have been unable to compete with others in certain crops will be found experimenting with new products. In the opinion of manufacturers, this diversifying of crops will do much to promote better conditions in all districts.

(Continued on next page)

Ohio Dealer Wins First Prize in A. E. A. Contest

14 Others Share in Awards for Best Photographs of Christmas Windows

CHICAGO, Jan. 10.—Results of the Christmas window-trimming contest conducted by the Automotive Equipment Association have been announced by the judges who made their awards from a study of hundreds of photographs submitted by dealers.

First prize of \$150 was awarded to Gorrell Motor Corporation of Zanesville, O. Cash awards were made to 14 others as follows:

Second prize, \$100, Standard Motor Car Co., Baton Rouge, La.; third, \$75, H. L. Arnold, Los Angeles; fourth, \$50, Henshaw Motor Co., Boston; fifth, \$25, Allen & Hebard Co., Portland, Ore.; 10 other prizes of \$10 each, Barnes Buick Co., Baton Rouge, La.; Foss Motor Co., Faribault, Minn.; Boller Auto Co., Grand Junction, Colo.; H. C. Harrison Co., San Francisco; Central Motor Sales Co., Springfield, Mo.; Thos. Plimley, Limited, Victoria, B. C.; L. C. Bolles, Inc., Plattsburg, N. Y.; Claude Nolan, Savannah, Ga.; H. J. Rodgers, Waverly, Ill.; Carl A. Anderson, Omaha, Neb.

This contest was conducted in connection with the A. E. A.'s merchandising campaign, the central theme of which was, "Something for the Car for Christmas." Under the leadership of Arthur R. Mogge, merchandising director of the A. E. A., hundreds of dealers' windows through the United States and Canada were equipped with beautiful Christmas displays and special meetings were held in many cities to organize the holiday effort.

Judges of the contest were: Neal G. Adair, editor of Motor World; T. F. Cullen, Automobile Trade Journal; R. P. Sloan, Automobile Topics; H. A. Tarrant, editor of Motor; Kenneth Cloud, editor of Jobber Topics; Clyde Jennings, editor of Motor Age; and S. P. McMinn, editor of Automotive Merchandising.

WILSON PEERLESS MANAGER

NEW YORK, Jan. 11.—Earl B. Wilson, former sales manager of the branch division of the Peerless Motor Car Co., has been appointed general sales manager. This position was previously filled by D. A. Burke, who was elevated to the position of general manager of the company following the resignation of R. H. Collins.

Mr. Wilson is one of a large group of executives who left the implement and vehicle field to become identified with the automotive industry. His first connection with the industry was with the Chicago branch of Buick when Mr. Burke was in charge of that branch. Subsequently he became Buick branch manager at Memphis and Philadelphia and director of sales at the factory at Flint.

Shortly after Mr. Burke became affiliated with Peerless, Mr. Wilson joined

the Peerless organization to do special work in the sales department. He had not served long in that capacity when he was advanced to the position of sales manager of the branch division.

Dodge Bros. Dealers Can Deliver Dodge Watercar

NEW YORK, Jan. 12.—Sales and service arrangements have been effected between the Horace E. Dodge Boat Works and Dodge Bros., Inc., whereby deliveries of the Dodge Watercar, a motor boat made by the former company, may be had from any Dodge Bros. dealer, according to announcement at a showing of the boat in the Pennsylvania Hotel during New York show week.

The fact that the boat may be serviced through any authorized Dodge Bros. dealer is offered as a remedy to service difficulties experienced by motor boat owners. The engine used in the boat is the same engine used in the motor car, giving a speed of about 20 miles an hour.

SAFETY COMMITTEES MEET

NEW YORK, Jan. 12.—The Traffic Planning and Safety Committee of the National Automobile Chamber of Commerce, of which George M. Graham is chairman, met this week in conference with President Thomas P. Henry of the American Automobile Association, which is planning a similar committee with a paid executive to handle the campaign. Accompanying Mr. Henry was W. E. Mentzger and Dr. James J. Inches of the Detroit Automobile Club.

The N. A. C. C. committee formally decided to work with other existing safety efforts, particularly in locally applied campaigns. The committee hopes to be a stimulating force, campaigning for certain basic principles of sound and safe traffic operation.

(Continued from preceding page)

Feeling among dealers in the small communities is reported very good, and bankers are giving satisfactory co-operation. Used cars are practically unknown for the reason that farmers, as a rule, use their vehicles until their value is exhausted. Cars taken in trade are usually low priced cars and are appraised low, making ready turnover.

That farmers have been buying cars to a large extent in 1923 and will continue to be a strong factor in the 1924 market is the opinion of A. R. Erskine, president of the Studebaker Corp.

"Farmers have been buying cars to a large extent in the South and in the Kansas City and some other middle western and southern territories, and I look for a continuance of this good business in 1924," said Mr. Erskine.

Mr. Erskine pointed out that the big increase in sales in 1923 has been in the class of the wage earners, whose earnings were still 150 per cent above the pre-war standard, while the cost of living was less than 100 per cent.

Average Selling Price of a Used Car in '23 Was \$308.03

N. A. D. A. Issues Report Showing That 3,091,440 Used Cars Were Sold Last Year

ST. LOUIS, Jan. 12.—The average selling price of a used automobile in 1923 was \$308.03. Used cars sold from January 1, 1923, to December 1, 1923, numbered 3,091,440. These figures were announced by the National Automobile Dealers' Association here today. The fourth phase of a national study of the used car business was completed this week. The work has covered two years time.

A complete and detailed report of this two years work will be made in the seventh annual convention of the N. A. D. A. in Chicago at Hotel La Salle, Tuesday and Wednesday, January 29 and 30. This report will be a feature of the used car forum which will occupy most of the second day of the convention.

The heavy losses that were sustained by automobile dealers in 1921 and 1922 were checked in 1923. Executives of the National Automobile Dealers' Association are confident that the \$123,000,000 loss recorded by dealers in 1922 in the sale of used automobiles was only a part of the actual loss. The figure quoted represents only the difference between the price which the dealers allowed for the cars taken in trade and the price at which they later resold the cars. The figure does not include the cost of reconditioning, overhead, selling commission and advertising expense.

The same condition is true of 1923, in which the losses were reduced to \$57,347,000. Adding the four items of handling-charge mentioned, and even the losses for 1923 were still enormous. N. A. D. A. executives believe that these losses are clearly the cause of the heavy mortality in the automobile dealer ranks.

A. A. A. TRAFFIC BOARD

NEW YORK, Jan. 14.—A meeting of the executive board of the American Automobile Association was held at the Biltmore today at which it was decided to create a fifth standing committee which is expected to be one of the most important of all the A. A. A. bodies. This is to be the Traffic Board which will be in charge of a paid executive, while the committee will be made up of the greatest authorities on the subject of traffic safety and city planning that the A. A. A. can round up. In a way this committee will be somewhat similar to the National Automobile Chamber of Commerce's Traffic and Safety Committee of which George M. Graham is chairman, having practically the same reforms in mind.

FORD ORDERS MASONS

KENT, O., Jan. 14.—The Mason Tire & Rubber Co. announces that it has received an order from the Ford Motor Co. for 50,000 tires a month.

Insurance Companies Reduce Rates Six Per Cent to Owners

Accident Insurance Is Cut; Property Damage Is Increased Slightly

NEW YORK, Jan. 14—Revision of the rates and rules for automobile accident insurance by the National Bureau of Casualty and Surety Underwriters has not only brought about lower rates but also gives insurance protection to all the persons who may at different times drive any one car, the same rate applying whether the car is used for business purposes or for pleasure only. Heretofore, an owner, in order to secure the lowest possible rate had to agree to use his car for pleasure only and to drive the vehicle himself.

The new schedule of rates shows an average reduction of 6 per cent in the rates for public liability insurance for the country as a whole and reductions as high as 20 per cent in some cities. There has been, however, a slight increase in the rates for property damage insurance, due to the increased number of minor collisions without personal injuries.

Experts who gathered the data for the rate revision found that in the cities of medium size and in the rural districts

of the south and far west there has been the greatest reduction in motor vehicle accidents in recent years. The new schedule therefore shows that the highest rates for public liability insurance must be paid by owners in New York City, with Buffalo, Philadelphia, Boston, Jersey City, Cleveland, Providence, St. Louis, Chicago, Pittsburgh, Albany, N. Y., Syracuse, N. Y., Rochester, N. Y., and Youngstown, O. following in the order named.

HALEYVILLE DEALERS ORGANIZE

HALEYVILLE, Ala., Jan. 14.—Several of the automobile dealers of various towns in Winston county held a meeting here last week and organized the Haleyville Motor Dealers and Garage Association, and will meet in future at least once each month for the purpose of exchanging sales and merchandising ideas, discussing general conditions as affecting the industry, etc. Officers named were B. J. Cowart, of the Cowart Motor Co., of Haleyville, president; A. McDonald, vice-president, and N. P. Robinson, secretary and treasurer. Dealers present, representing the industry in the smaller sections where most sales are to farmers, were enthusiastic over the volume of business they have enjoyed the past four or five months and look for 1924 to prove the best year they have ever enjoyed.

Peerless Plant Again Opens After Preparations for Six

Extensive Changes Made in Cleveland Plant Where New Car Will Be Built

CLEVELAND, Jan. 14—Operation at the Peerless Truck and Motor Co. plant in this city were resumed Jan. 7 after a shut-down of three weeks, during which extensive factory changes were made preparatory to the manufacture of the new Peerless six, along with the eight-cylinder car.

When the factory reopened operations were started with new executives in charge. During the close-down R. H. Collins resigned as president and general manager, as did W. H. Collins, vice-president. An executive committee is now supervising the conduct of the business, and D. A. Burke, vice-president and general manager, is in direct charge of the business.

It was learned, although no official statement was made, that the present system, with Burke at the head and the executive committee supervising policies, will continue for some time.

A part of the revamping program includes the building of a shipping plant and a structure that will be used for the assembling of the six-cylinder car. This room will contain approximately 35,000 square feet of floor space and will be completed in 20 days. The shipping building is now about ready for use.

Monday the Peerless organization commenced to move materials through the plant for the eight-cylinder car, and within a week these cars will be ready to ship. On Jan. 14 the company will start materials through the plant for the six-cylinder car, and these will be ready for shipment about March 1. We will start with a very reasonable production and gradually increase it to reach heavy production in February and March.

Mr. Burke stated that the company sold in December, 1923, within 21 as many cars as were sold in 1922, which, in view of changes in executives, is considered good. The company has on hand orders for as many eight-cylinder cars as it had a year ago at this time.

Burke was one of a number of important executives who left the agricultural implement field in the early days of the automobile and took up their work with the infant industry. During the greater part of his career in the auto industry before coming to Peerless, about two years ago, he was in the organization of the General Motors Co. Four years ago the management of General Motors Co. took cognizance of his unusual organizing ability, as well as knowledge of manufacturing, wholesaling and retailing methods by promoting him from his post with the Buick organization to a special executive position at the headquarters office. He was engaged in this task when he came to Cleveland two years ago.

Officers of Indiana Automotive Manufacturers' Association



The Indiana Automotive Manufacturers' Association was recently reorganized and has become active in automotive affairs of the state. Top row, left to right—Will H. Brown, Nordyke & Marmon Co., president; L. E. Porter, S. F. Bowser Co., vice president; Lon R. Smith, Smith & Wilson Co., secretary; lower row—J. I. Farley, Auburn Automobile Co., vice president; F. F. Chandler, Ross Gear & Tool Co., vice president; George T. Bryant, Robert I. Hassler, Inc., treasurer.

As Principal Speaker, Schwab Makes Debut at N. A. C. C.

**Tells Fellow Manufacturers There Is
No Limit to World Demand
for Cars**

NEW YORK, Jan. 12—Charles M. Schwab, controlling the Stutz Motor Car Co. of America, made his real debut as an automobile manufacturer Tuesday night when he was the principal speaker at the annual banquet of the National Automobile Chamber of Commerce at the Commodore Hotel.

Talking to his fellow manufacturers, he declared that there is no limit to the world demand for motor cars, and then he aired his views as to production costs, declaring that selling expenses should be reduced and suggesting consolidation as a remedy in lowering overhead. In Mr. Schwab's opinion, the number of concerns manufacturing motor cars should be reduced from 70 to 5 or 10 by consolidations, which would effect economies of production which would enable those in the reduced field to make money commensurate with their capital investment.

On this point Mr. Schwab said:

"I believe that all business, to be successful and for the good of mankind, must be done in the most economical manner possible, that you must exercise economy in production in every way to continue the development and use of that which you manufacture.

"Great economies can only be made in great units. When the steel interests were a heterogeneous collection of small works over the country, each vying with the other for a little advantage in some particular direction, and those enjoying great natural advantages going to the front, it didn't develop the economies of the industry as they ought to have been developed. I believe instead of 60 or 70 of you great automobile concerns, you ought to have 5 or 10. And then work in the spirit of co-operation that will enable capital invested in this industry to have a fair return on capital invested.

"If I understand this industry aright, you have devoted all the talents of the distinguished gentlemen in the business to seeing how cheaply you could build your cars. Have you overlooked the fact that if a car costs you a thousand dollars to build, you have to spend five hundred dollars more to deliver the car to your customer? You cannot possibly make any such saving in manufacture, but with the combined interests, with the combined ingenuity of this great crowd of people, I am sure that you can devise methods of making that great saving in the selling of your cars to the public.

"It is not within my province to tell you how. But no problem industrially ever confronted the people of this United States that they did not meet. My advice to this great industry is: Stop them if you have to because there are many in all industries that have no right and

legitimate place in industry. Stop them and scrap them if you will.

"But consolidate your interests so that economies may be practiced by reason of the great overhead that follows all these individual efforts.

"That, to me, is the great problem which you will work out in the next 10 years. The better you make your cars and the cheaper you put them in the hands of the customer, the greater will be the use and the greater the demand."

Edward J. Cattell of the Philadelphia Chamber of Commerce was the second speaker of the occasion.

The annual decorations for meritorious service were awarded to the following: A. P. Sloan, Jr., president, General Motors Corp.; F. J. Haynes, president, Dodge Brothers; Walter P. Chrysler, president, Maxwell Motor Corp.; Roy D. Chapin, chairman, Hudson Motor Car Co., and Edward V. Rickenbacker, vice-president, Rickenbacker Motor Co.

Roy D. Chapin, vice-president of the N. A. C. C., officiated as toastmaster.

Wisconsin Annual Convention Will Feature Milwaukee Show

MILWAUKEE, Wis., Jan. 14.—The annual convention of the Wisconsin Automotive Dealers' Association will again be a distinct trade feature of the sixteenth annual Milwaukee show, to be held Jan. 19-26 in the Milwaukee Auditorium. Between 1200 and 1500 dealers are expected to attend the convention, which is scheduled for Wednesday, Jan. 23, at 2:30 p. m., in room B of the Auditorium. Sessions also will be held on Jan. 22, 24 and 25, with numerous special features. The annual banquet and frolic will be held Wednesday, Jan. 23, starting at 10 p. m., in the Fern room of the Hotel Pfister. Officials of the association are: President, C. W. Collier, Green Bay; vice-president, A. H. Thom, Oshkosh; secretary, Bart J. Ruddell, Milwaukee; treasurer, Guy R. Wood, Eau Claire. The railroads have granted a special reduced rate of one and one-half fares for the round trip, which also applies to members of the families.

WINTHER TO PAY \$51,000

KENOSHA, Wis., Jan. 14.—Unsecured creditors of the defunct Winther Motors, Inc., Kenosha, Wis., will receive at least a small dividend on their claims as the result of the success of A. B. McCall in securing the dismissal of large claims for federal taxes against the Winther company. The government filed tax liens amounting to more than \$65,000 when the affairs were placed in the hands of a trustee a year ago. The claims have been settled for \$14,000, which leaves about \$51,000 held in reserve on this account to be distributed among unsecured creditors whose claims aggregate \$500,000 or more and who probably would not otherwise have shared in the distribution of dividends. Stockholders have no prospect of any dividends. Final settlement of the estate is expected to be completed by the middle of February.

Mitchell Creditors Called to Consider Sales Proposals

**Hupp, Ajax Rubber, Modine Mfg.
Co. and Chicago Interests
May Be Bidders**

RACINE, Wis., Jan. 14.—Creditors of the defunct Mitchell Motors Co., Inc., Racine, Wis., have received notice of a meeting to be held Monday, Jan. 28, to consider a number of propositions for the purchase of the real estate and buildings. The call was issued by Referee Milton Knobloch at the request of Herbert F. Johnson, trustee, who believe it will be possible to make disposition of the remaining assets and wind up the affairs within a short time.

Practically all of the machinery, equipment, stick, fixtures, etc., has been sold, and arrangements made for a source of supply of Mitchell parts guaranteeing owners service for five years. Out of excess parts stock not disposed of otherwise, a considerable number of Mitchell phaetons have been assembled by Mitchell workmen and offered for sale at \$987 by H. J. Weber, in charge of machinery sales for the trustee. Practically all of these cars have been disposed of.

Insistent rumors are in circulation that the Hupp Motor Car Co. of Detroit is interested in the purchase of land and buildings, although some time ago officials at Detroit claimed disinterest. Hupp maintains its main body plant in Racine, which formerly was jointly owned by Hupp and Mitchell and is known as the H. & M. Body Corp. The Ajax Rubber Co.'s western production center at Racine also is said to be contemplating bidding for at least several buildings, and the Modine Mfg. Co., Racine, radiators and cooling systems, for others. Wallace Ingalls, Racine attorney, representing Chicago interests, is said to have deposited a sealed bid for \$300,000 for the land and buildings, but this will not be opened until Jan. 28 at the creditors' meeting.

The report of the appraisers placed a valuation of \$900,000 on real estate and improvements bare of any equipment.

GREEN BAY WINTER SHOW

GREEN BAY, Wis., Jan. 14.—Another of the series of local shows being conducted in various districts of Wisconsin during the winter months under the direction of O. C. Hoffman of Milwaukee was that held in the Armory at Green Bay, Wis., Dec. 26-30. The American Legion sponsored the exposition, which was the first to be held here during the winter. The annual Brown county show is held in August in conjunction with the county fair at DePere, near Green Bay, under the auspices of the Green Bay Automobile Dealers' Association, which erected its own building on the fair grounds for this purpose. The show building at other times of the year is used by dealers for the storage of new and used cars, as occasion may require.

Board of Directors Elected At Annual R. A. A. Meeting

Recommendations for Oversize Low Pressure Tires on Existing Standard Rims

NEW YORK, Jan. 12—At the annual meeting of the Rubber Association of America held here Monday the following members of the Board of Directors were elected: G. E. Hall, Boston Woven Hose & Rubber Co.; W. F. Pfeiffer, Miller Rubber Co.; E. H. Broadwell, Fisk Rubber Co.; A. L. Schuer, Kelly-Springfield Tire Co.; J. C. Weston, Ajax Rubber Co.; C. T. Wilson, Charles T. Wilson Co.; C. B. Sereg, United States Rubber Co.

It was learned that the executive committee of the Tire Division of the Rubber Association recently has recommended the following "oversize low pressure tires for existing standard rims" to bear following nominal size marking and the phrase "balloon type, interchangeable with — (nominal size of present tire replaced) for passenger cars only":

| | |
|-----------------------------|---------------|
| 31x4.40 (straightside)..... | 30x3½ |
| 32x4.95 | 30x3½ or 31x4 |
| 33x4.95 | 32x4 |
| 33x5.77 | 31x4 or 32x4½ |
| 34x5.77 | 32x4 or 33x4½ |

The last two sizes are substantially identical with those used in case of Michelin "comfort" tires for existing rims. Michelin does not list the first three sizes but is producing 35x6.60 in. to replace 32x4½ or 33x5 in. sizes and 37 x6.60 in. to replace 34x4½ or 35x5 in. sizes.

No announcement has been made as yet concerning the inflation pressure which the new balloon type tires will carry.

General Tire Net Earnings For 1923 Are \$1,200,000

AKRON, O., Jan. 11—Reports made at the annual meeting of the General Tire & Rubber Co. show that net earnings for 1923 were \$1,200,000 on gross sales of \$9,000,000. Last year's sales were \$7,600,000. The business in units was 51 per cent greater than in 1922. These earnings are equivalent to \$30 a share on the common stock, which now has a par of \$50 and is quoted on the market at better than \$150. Of the \$1,200,000 earnings, \$1,000,000 was earned the first half of the year.

The financial statement shows that though the company declared a 100 per cent stock dividend a year ago, always has paid its cash dividends regularly on both preferred and common, and also declared a special 6 per cent dividend on common just before Christmas, the surplus has been built back to close to \$900,000 during the year. Incidentally the company paid for three new plant additions out of its 1923 earnings, and retired some \$90,000 of preferred stock, three times the charter requirements.

Advancement of executives of the General Tire & Rubber Co. was an-

nounced at the annual meeting. William O'Neill was elevated to the presidency, succeeding M. O'Neill, who remains as chairman of the board. Mr. William O'Neill formerly was vice-president and general manager. Other changes included the election of C. J. Jahant, superintendent, to vice-president, the naming of W. E. Fouso, secretary, as a vice-president and the choice of T. F. O'Neill, hitherto a director, to be secretary. Charles Herberich was re-elected treasurer, W. E. Fouso was made assistant treasurer and W. J. Cahill assistant secretary.

New Templar President Is Former Dealer



T. L. HAUSMANN

CLEVELAND, Jan. 12.—The man at the head of the newly organized Templar Motor Car Co., which is putting into production a six-cylinder Templar car, President T. L. Hausmann, is an old timer in the automotive industry, according to facts about his career connecting him up with early days of the industry.

Back in 1908 Mr. Hausmann was head of the Mercer Motor Car Sales Co. in New York City. Later he became Willys-Overland distributor in St. Louis where he was known as probably the largest independent automobile distributor in the country. He prospered and in 1920 he retired from business and went to live on his estate in Florida. But when the call came to him to head the Templar rehabilitation he yielded to the desire to get back into active business life.

SHOW AT ROME, N. Y.

ROME, N. Y., Jan. 12.—The Rome Automotive Dealers' Association will hold its first automobile show Jan. 24 to 26, in the large sales rooms of Smith Brithers Ford agency.

Motor Travel Over Lincoln Highway Increases Greatly

Motor Visitors Adds 160,000 Inhabitants to Southern California Population

NEW YORK, Jan. 14—Motor tourist travel from the east and middle west to the Pacific Coast in 1923 over the Lincoln Highway and other connecting roads increased 50 per cent in 1923 over 1922, according to the figures gathered by Secretary A. F. Bennet of the Lincoln Highway Association. As checked by the Automobile Club of Southern California 234,000 cars from eastern points reached the Pacific Coast last year. Averaging four persons to a car gives a grand total of 936,000.

Southern California figures that its motor visitors added approximately 160,000 to its population last year, equivalent to adding a city like Bridgeport, Conn., Grand Rapids, Mich., or Dallas, Texas. These people motored to California, then decided to stay there.

"The Los Angeles Examiner estimates that the number of motorists arriving in Los Angeles alone during 1923 was equivalent to moving the entire population of Kansas City there by motor," said Secretary Bennet in announcing his findings. "Through traffic on the Lincoln Highway west of the Mississippi river last year certainly did not total less than 25,000 vehicles or 100,000 people. The majority of the traffic headed for Northern California on the Lincoln Highway was diverted at Salt Lake City during the past year and sent down through the Mohave Desert to Los Angeles."

Organize 90 Per Cent of Gas Stations in West New York

BUFFALO, N. Y., Jan. 12—Proprietors of gasoline filling stations in Rochester, Monroe and adjacent towns in western New York are out for big fields to conquer. After organizing 90 per cent of the station proprietors, the Western New York Gasoline Dealers' Association is endeavoring to extend their territory as far east as Syracuse and west to Buffalo. An organizer has been sent out to visit all territory included.

At a recent meeting of the association it was voted to assess each dealer in the association 2 cents a gallon on all gasoline sold in a given week to defray expenses of the organizer. The week of the assessment was not fixed.

Besides the proposal to extend the territory, the gasoline dealers will go in for chemistry, so that they may be able to test their own gasoline, to determine whether it is good or bad.

The proposed law to tax gasoline instead of automobiles through the license plate system was also discussed. There was some uncertainty as to how it would affect the business, and no action was taken.

Body Builders Association Calls for Repeal of Taxes

Resolutions Call Excise Levy "Particularly Objectionable" and Support Clancy Bills

NEW YORK, Jan. 10—Strong resolutions calling for the repeal of obnoxious excise taxes on passenger cars, trucks and parts were adopted by the Automobile Body Builders' Association at its mid-winter meeting held yesterday at the Waldorf-Astoria. The resolution had previously been adopted at a meeting of the commercial and bus body section, of which Chester Hummell is chairman.

It is pointed out in the resolution that tax upon tax has been piled upon the automotive industry and the users of its products. The excise levy is particularly objectionable, because it has been retained after the repeal of such imposts on commodities which are purely luxuries, and as it now stands is an added tax upon transportation.

The resolution petitions Congress to support the bills introduced by Representatives Robert F. Clancy of Michigan, calling for the repeal of the excise taxes upon automotive products. Copies will be sent not only to all members of Congress but to President Coolidge and to Secretary of the Treasury Mellon.

A letter was read from Representative Clancy in which he declared the protest of the industry against excise taxes had not been vigorous enough, and that Secretary Mellon had not been convinced they should be repealed. He added, however, that he had convinced the Democratic minority in the House that the tax on trucks, at least, should be removed and that the progressive element of the House was in sympathy with this proposal. An attempt has been made to obtain the truck tax repeal first, because that is the weakest link in the chain of automotive imposts and also because it brings in revenue approximateing only about \$10,000,000 a year.

Representative Clancy said he had asked Senator Edge of New Jersey to introduce his bills in the Senate. He warned that there must be no delay in sending letters and telegrams of protest to members of Congress.

Harry Meixell, chairman of the legislative committee of the National Automobile Chamber of Commerce, urged the body builders to stand with other branches of the industry on all questions of legislation and taxation, so that a united front could be presented. He declared opposition to unfair measures should be based on principle rather than on selfish interests.

Harold Seaman reported that the passenger body section had decided to take up intensively the subject of uniform cost accounting in the hope that in this way unfair competition not based on economic considerations could be eliminated. A study of the question will be made by Charles Barnes, as a representative of

the association, through the United States Chamber of Commerce.

It was decided to hold the mid-summer meeting of the association at the Hotel Statler in Detroit, June 3 and 4.

Standards Bureau Cannot Test Brakes

NEW YORK, Jan. 12—A. A. Mowbray, commissioner of the Asbestos Brake Lining Association, announced at a meeting this week that the United States Bureau of Standards had advised him that it would not be able to continue its work in testing brake lining materials for wearing qualities. Lack of funds was the reason given. This work of the Bureau of Standards has been of great value to the automobile in past in enabling manufacturers to get accurate reports on lining materials before adopting them. A campaign will be launched to induce Congress to appropriate funds for the bureau to again take up this work, which is considered of great importance to safety.

CHANGES IN BIRMINGHAM

BIRMINGHAM, Ala., Jan. 14—Two changes of considerable importance in Birmingham automotive circles center around the sale of the Scouten Motor Co. to the Dominick-Murphy Motor Co.

E. L. Scouten, formerly president of this concern, will be vice-president of the Drennen Motor Car Company of Birmingham and sales manager of the Cadillac retail division of this concern.

M. P. Dominick is the president of the new concern and W. E. (Pat) Murphy, for years with the Oldsmobile Company of Alabama and the Drennen Motor Car Co., both of Birmingham, will be vice-president and general manager.

The Dominick-Murphy Motor Co. will handle the Chalmers, Maxwell and Chrysler in Birmingham.

FILE OGREN CLAIMS

MILWAUKEE, Wis., Jan. 14—Julius J. Goetz, recently appointed receiver of the Ogren Motor Car Co., 697-711 National avenue, Milwaukee, has given notice to creditors that all claims must be filed within six months of Jan. 10. The litigation started in the form of a petition for a receivership to the Milwaukee County Circuit Court made by the Cleveland (O.) Hardware Co. The Ogren company suspended production of the Ogren Six about July 1, 1923, and the bulk of its shop equipment has been sold.

RECEIVER FOR TITAN

MILWAUKEE, Wis., Jan. 14—Upon the application of the Western Metal Specialty Co., the Milwaukee County Circuit Court has appointed Julius J. Goetz receiver of the Titan Truck Co., Milwaukee, manufacturing the Titan motor truck. Creditors have been notified to file claims within six months from Jan. 8, 1924. Stein & Gottschalk, 105 Wells street, Milwaukee, are attorneys for the receiver.

Tax Collection Rulings Make Clear Title to Car Necessary

Used Car Dealers in Alabama Have Difficult Time Meeting Tax Complaints

BIRMINGHAM, Ala., Jan. 14.—Recent rulings on tax collections in Alabama have made it necessary for the used car dealer and the man who would sell his used car direct to clear the title on the car in much the same way that a title is cleared on a piece of property when it is transferred.

For instance: for many years it has been the habit of many people residing in the state to fail to return their automobiles for property tax. The car absolutely carries these accrued taxes by a new ruling. A car was purchased in 1918, the original owner failed to return it for taxes and sold it in 1919, or traded it in, it was sold again in 1920 and again in 1921, then in 1923 the owner managed to turn it in on a new car, and it was sold at practically nothing to a laborer in one of the industrial plants of Birmingham. When this laborer went to the court house to get a license for the operation of the car he found that it was necessary to declare the car for property tax before he could secure a license. When he tried to return it he found that the back taxes on it were almost equal to the value of the car.

As a result of these findings our present owner naturally goes back to the concern which sold him the car and makes a big complaint. Now what can the used car man do? There is no way in the world for him to get the delinquent parties to come up with the taxes, the car is responsible for the accrued taxes and the man who bought the car is faced with, what to him, is real financial disaster, and will possibly prefer not to use the car to paying the taxes and if bought on time will certainly default in payments and let it go back to the dealer, who would almost rather let it go than try to straighten out the tangle. The result was that a large number of rather old cars went to the scrap heap without being returned for taxes at all. On the other hand the new rule among a great many dealers is to sell the car with "title cleared."

A great many dealers seeing the trouble to which they were putting their customers, decided that clearing the titles before sale was the only way. A statement from one of these concerns shows the entire tangle and the way they straightened it out for their future customers.

"Elimination of all red tape in the matter of procuring license tags will be a part of our offer in the present used-car sale," said D. C. Harris, manager of the rebuilt car division of the Drennen Motor Car Company. "All taxes have been paid on the rebuilt cars that we are offering for sale and all you will have to do is to pay the license fee and procure the tag."

Colin C. Campbell Urges Real Confidence in 1924 Business

Believes That Registration Will Rise to 25,000,000 Within Four or Five Years

NEW YORK, Jan. 12—Speaking at the dinner to Chevrolet dealers of the North Atlantic district, Colin C. Campbell, vice-president and general sales manager, warned against over-confidence, but urged real confidence in 1924 business and in the future of the industry. He expressed conviction that registrations of motor cars will mount to 25,000,000 within four or five years with a normal replacement market of four to five million yearly.

The dinner was attended by approximately 1,200 members of the dealer family and of factory sales organizations. Members of the General Motors executive board and officers of Chevrolet were guests at the dinner and were introduced by Mr. Campbell, who described the relations of each to the activities of Chevrolet. Of those introduced, the speakers were P. S. duPont, chairman of the board, General Motors Corp., and George Frank Lord, advertising manager. B. C. Forbes, also a guest, spoke briefly on 1924 business outlook. C. E. Lawson, assistant general sales manager, was toastmaster.

There has been too much loose talk about severe competition in 1924, Mr. Campbell said. There has never been anything else. It will be no worse next year than in any other year. Dealer confidence in Chevrolet was as important to the company as their money, he said,

and he asked that they show their obligation to the company by more good will and more intensive sales effort. Business in 1924 can be had, he said, not only by manpower but by preparation.

Mr. duPont said the expanse of the automotive industry was beyond the vision of any man today. There will be more progress in the next 100 years than in the past, and things we say today will appear ridiculous 20 to 40 years hence. Dealers, he said, need have no fear in motor kingdom, much less have fear in General Motors. There is no reason why it should not keep its lead, he said, and he described the harmony within its ranks as insuring continuance of its strength.

The coming year can be made a good business year, Mr. Forbes said. The political developments will have a certain amount of influence, he said, but there is not much danger to business. No automobile company will be able to take it easy if they expect to finish as good as in 1923. Business will only be found, he said, by going after it. "Ring more doorbells," he said, would be a good slogan for dealers for 1924.

Chevrolet will spend as much for advertising as any manufacturer in the United States in the coming year, Mr. Lord said. Through advertising, he said, the company will prepare the way for its dealer organization to realize on the biggest year's business they ever have had.

Dinner meetings similar to the New York meeting will be held in all parts of the United States during the next few months, the next ones being scheduled for Detroit and Chicago during the shows in those cities.

\$9,280,032 Nash Net Income for Year Ending November 30

Statement Given Following Director's Meeting; \$1.50 Extra Dividend Declared

NEW YORK, Jan. 12—Net income of the Nash Motors Co., of Kenosha, Wis., for the fiscal year ended Nov. 30, 1923, amounted to \$9,280,032 after deducting all expenses and after provisions for Federal income taxes of \$1,442,230. This is equivalent to \$29.56 a share after preferred dividends. An increase in the common capitalization outstanding from approximately 55,000 shares to 273,000 shares accounts for the lowering in earnings per share in the figures of the year. Net income for 1923 was substantially higher than for the preceding year.

The annual statement was given out following the meeting of the Nash directors today at which an extra dividend of \$1.50 a share on the common stock, in addition to the regular semi-annual dividend of \$3.50 a share was declared. The regular quarterly dividend of \$1.75 on the preferred also was announced, all dividends being payable Feb. 1 to stock of record Jan. 18.

The balance sheet shows real estate, plant and equipment, at cost, listed at \$8,634,401. The reserve for depreciation against this is \$3,665,071, leaving the property account at \$4,969,329. Current assets amount to \$28,441,342 and current liabilities to \$1,792,864, leaving net working capital of \$26,648,478.

Discussing the annual statement, President C. W. Nash says:

On Feb. 1, 1923, the company retired its \$3,500,000 outstanding balance of its original preferred stock. During the year the company retired \$619,100,000 at par of the preferred A stock, which is more than sufficient to take care of the sinking fund requirements. In addition to this, during the year the company paid its stockholders in cash dividends \$2,845,850. Despite this, the cash position of the company continues to be satisfactory, showing an increase of \$3,104,863 over a year ago; the total at the close of the year being \$21,692,250 for cash in hand, in banks and in government securities.

FEDERAL PLANS CAMPAIGN

NEW YORK, Jan. 10.—Federal Motor Truck Co. is planning an important merchandising campaign in connection with its new Federal Knight express which is being shown for the first time at the New York show. The company plans to merchandise approximately 10,000 of these during the coming year and will make large additions to its dealer organization, both in the United States and foreign countries.

Through the use of the Knight motor in the truck, the only truck so powered on the American market, the company will be in position to make special appeal to dealers handling cars using this engine, as their service facilities are practically already complete to handle the model.

They Look After Franklin Service



Traveling service representatives of the Franklin Automobile Co. recently closed a three-day conference at the factory at Syracuse, N. Y. Those in the photograph, made at the factory, are, from left to right:

Front Row—Frank Raymond, A. J. VanWagner, T. J. Mitchell, F. M. LaVoy, L. E. Wise, K. F. McNeill, E. B. Miller, sales engineer; L. B. Benham, chief correspondent; F. J. Leyerle, service manager.

Middle Row—L. A. Heuschneider, L. R. Hodge, manager Technical Service; J. K. Losee, L. J. Kelsey, L. C. Kenyon, L. R. Seibel, Ralph Ross, H. L. Skinner, G. M. Hammar, R. H. Bennet, G. P. Texada, engineering department; R. V. Ward, K. C. Haven, service engineer; William Sanford.

Top Row—F. J. Schaefer, John Clark, K. R. Trevor, Richard Haug, T. M. Lucas, F. J. Price, T. E. Talbott, A. D. Hollington, T. R. Keery, Bernal Foster, Robert Fisher.

Willys Tells Newspaper Men of Great Plans for 1924

**Has Built a Total of 1,150,000 Automobiles in Sixteen Years
in Business**

NEW YORK, Jan. 12.—John N. Willys was the top liner at the luncheon at the Biltmore Monday, tendered by Ward M. Canaday, head of the United States Advertising Co., which handles the Willys-Overland account, to the New York newspaper men. In his talk to his journalistic friends the president of the Willys-Overland Co. gave his estimate of 1924 production at 4,500,000, of which total he hopes to contribute 300,000 units.

"In my 16 years with Overland we have built a total of 1,150,000 cars," said Mr. Willys. "In the first year we turned out 465. In 1915 we made 142,000; in 1917 140,000; in 1918, 82,000; in 1920, 110,000; in 1921 we dropped to 46,000; jumped to 95,000 in 1922 and the past year we established the record of 200,604.

"I am glad to report that since we adopted the Knight engine the production of Willys-Knight cars has increased each year and in 1923 we made from 110 to 115 per cent more Willys-Knights than we did in 1922.

"We have balloon tires and four-wheel brakes as the outstanding features of the present show, with nothing radically new mechanically. As I see it, we can look in the future for increased engine efficiency. In this direction the engineers are making wonderful advances and I think that in another year our company will be able to show you about ten horsepower more out of the same size engine we have now.

"In the matter of four-wheel brakes, I am not saying I won't put them on; neither will I say that I will—I am neutral at present and I am making every effort to thresh out the problem satisfactorily to everyone concerned."

TWO CHICAGO CHANGES

CHICAGO, Jan. 12.—Two important changes have just occurred in retail representation on the Michigan avenue automobile row. Charles E. Gambill, Hupmobile distributor at 2230 Michigan avenue, has taken a retail dealership for the Chevrolet and has organized the Michigan Avenue Chevrolet Co. Quarters will be in the building now occupied by the Gambill Motor Co., the Hupmobile distributing company. Mr. Gambill, who is vice-president of the National Automobile Dealers' Association, has also handled the Marmon for a number of years. He will give up this agency and another company is being organized to take it over. Mr. Gambill continues the Hupmobile representation.

The second important change is that in the Michigan avenue retail agency for Overland and Willys-Knight. The factory branch of Willys-Overland, Inc., which formerly handled this retail business, has given it up and Gordon Motor Co. has taken it over, continuing to operate at

Program of National Automobile Dealers' Convention

TUESDAY, JAN. 29

19th floor La Salle Hotel, Chicago

- 10:00 a. m. Call to order—G. G. G. Peckham, Cleveland, Ohio, president National Automobile Dealers' Association, presiding.
- Report of General Manager, C. A. Vane.
- 11:00 a. m. Automotive forecast for 1924—J. H. Collins, manager Research Dept., Chilton Co., Philadelphia.
- 11:15 a. m. "5% Net"—C. E. Gambill, vice president, N. A. D. A.; President, Gambill Motor Car Co., Chicago.
- 12:30 p. m. Appointment of Committees.
- Lunch.
- 2:00 p. m. Call to order.
- 2:15 p. m. "Dodge Brothers and Its Dealers"—John A. Nichols, Jr., sales manager, Dodge Bros.
- 3:00 p. m. "Shakespeare as a Salesman"—William B. Burrus, Sales Consultant, Kansas City, Mo.
- 4:15 p. m. Adjournment.
- 6:00 p. m. Sixth Annual Trade Frolic and Dinner.
- Address, "Building a Sales Organization"—G. H. Abercrombie, sales manager, Fuller Brush Co., Hartford, Conn.

WEDNESDAY, JAN. 30

- 10:00 a. m. N. A. D. A. Records for Dealers' Dollars—Harry M. Fancher, C. P. A., secy.-treas., Tom Botterill, Inc., Denver, Colo.
- 10:45 a. m. The Appleby Plan—James E. Appleby, Percy Chamberlain Associates, Inc., Detroit, Mich.
- 11:30 a. m. The Atlanta Statistical Bureau—R. H. Martin, president, Martin-Nash Co., Atlanta, Ga.
- 12:30 p. m. Lunch.
- 2:00 p. m. Cleveland Dealers' Green Seal Results—R. J. Schmunk, Hudson-Essex Distributor, Cleveland, Ohio.
- 2:45 p. m. N. A. D. A. Leadership, a \$50,000,000 Asset—Lynn M. Shaw, Asst. Gen. Mgr., N. A. D. A., St. Louis, Mo.
- New business.
- Revision of by-laws.
- Election of officers.
- Adjournment.

the old quarters, 2421 South Michigan. This company is headed by David Gordon who owns two other retail concerns, the Standard Motor Car Co., 3301 West North avenue, Overland and Willys-Knight, and David Gordon Motor Car Co., 3305 West North avenue, Nash.

FORD JACKSONVILLE PLANS

ATLANTA, Ga., Jan. 14.—According to the Atlanta branch of the Ford Motor Co. construction of the large assembly plant at Jacksonville will begin at a comparatively early date, the plant to be somewhat larger than originally planned. An additional acreage on the water front has been purchased by the company from the city of Jacksonville for \$50,000, which is in addition to a \$56,000 purchase of a site previously made. The plant will represent an investment of about \$350,000, and will have a daily capacity of about 150 Ford cars.

GAS DEMAND GAINS ON SUPPLY

WASHINGTON, Jan. 10.—The demand for gasoline, attributed almost solely to the growing popularity of the automobile, is gaining slightly on the supply. Figures just compiled by the U. S. Bureau of Mines show that on December 1 there was an increase of 15 per cent in the total demand, as compared with a year ago, and an increase of only 11 per cent in the supply. The refineries, however, had on hand on December 1, 27 per cent more gasoline than they had the same date a year previous.

CONTRACTS FOR FORD PLANT

CHARLOTTE, N. C., Jan. 12.—Contracts for the new Ford assembly plant buildings have been let for approximately \$750,000. This does not include plumbing, lighting, and heating. Construction work begins immediately.

December Production 296,595 4,005,230 Total For Year

NEW YORK, Jan. 12.—With the December production estimated at 296,595 cars and trucks, which is 34 per cent better than December, 1922, the total production for 1923 reached 4,005,230, according to a report read at the monthly meeting of the directors of the National Automobile Chamber of Commerce this week.

The directors also were told by General Manager Alfred Reeves that retail trade conditions will equal the excellent record of last winter. The truck market is holding firm, registering increases in most of the large cities. The passenger car end of the business is likewise in a healthy condition, with used car stocks the same to slightly less than a year ago.

FARMERS WILL BUY

WASHINGTON, Jan. 15.—A survey of the outlook for the American farmer has just been made by the Committee on Statistics and Standards of the United States Chamber of Commerce, and based on same, the prediction is made that during 1924 farmers throughout the country will be in a position to buy most of the necessities and many of the luxuries of life. Co-operative marketing and better opportunities of financing are the chief contributing factors in bringing about this situation, the survey states.

300 AT VELIE MEETING

NEW YORK, Jan. 10.—More than 300 dealers and distributors attended the Velie meeting and luncheon in the Commodore Hotel Tuesday at which the merchandising and advertising plans were outlined. W. O. Velie, Sr., welcomed the men.

IN THE RETAIL FIELD

The members of the Joplin Automobile Dealers Association at Joplin, Mo., have voted not to have an automobile show this winter. The fact that no building of sufficient floor space is available in the city is given as the reason for abandoning the show idea.

Announcement is made of the organization of the Boyer-Brouillet Motor Car Co., and its appointment as San Francisco distributor for the Overland and Willys-Knight cars. L. M. Stewart, manager of the Willys-Overland Pacific Co., made the announcement. The new company will handle the retail sales on both lines of cars in San Francisco, while the Willys-Overland Pacific Co. will handle the wholesale distribution of the cars in this territory. The Boyer-Brouillet company has taken over the showrooms and service quarters of the Franklin Motor Car Co., and opened for business on Jan. 1. Members of the new firm are G. A. Boyer, veteran automobile dealer on the coast, and Ray Brouillet, who for some time has been sales manager for the Anderson-Smith Motor Car Co.

Glen Laughlin of Batavia, Ia., has leased salesrooms at 407 Church street, Ottumwa, Ia., and will represent the International Motor Truck in Wapello county. He will confine his agency to the motor truck line.

Presley R. Cooper of the Lee-Cooper Motor Company at Kansas City, Mo., was elected president of the Blue Valley Manufacturers' and Business Men's Club at the annual election of officers.

The Parsons-Van Drew Tire & Rubber Co., Inc., St. Louis distributor for the Brunswick Tires, will move from its present location at 3336 Locust street to Delmar boulevard and Euclid avenue there to occupy the quarters which formerly housed Cicardi's Cafe before prohibition one of the most beautiful and popular cafes in St. Louis.

Thirty-five associate dealers of the Miller-Chevrolet Motor Company at St. Joseph, Mo., the members of the local agency and friends to the number of about 80, attended the first annual banquet of the company at the St. Francis Hotel in that city recently. Don Miller, president of the Miller-Chevrolet company was presented with a Shrine watch chain and charm. D. E. Ralston, Chevrolet branch manager at Kansas City, was one of the honored guests and delivered an address.

The Mississippi Valley Motor Co., St. Louis Oakland distributor, formerly located at 3137 Locust street which was the home of the St. Louis Motor Car Co., St. Louis Kissel and Jordan distributor, which company in turn has taken over the building at 3137 Locust street vacated by the Mississippi Valley Co.

The Barnes-Boyd Company of Mexico, Mo., Ford distributors, have leased the garage of the Hoxsey Motor Company in that city and have taken possession. Hoxsey will continue to represent the Buick and Cadillac interests in Mexico and will move soon to his new salesroom in the Hotel Hoxley building. Barnes and Boyd will continue the Ford sales and service and will do a general storage and garage business.

A garage building in Bethany, Mo., is being remodeled for the use of the Flint-Belden Motor Co., agents for the Ford, and will be occupied by this firm after Feb. 1.

The Howard Automobile Co., distributor of the Buick in San Francisco territory held its annual get-together meeting late in December, with Charles Howard, Jr., representing his father at the big duck dinner held in the Cliff House, and James Houlihan, advertising manager of the firm, acting as toastmaster. The entertainment, in addition to short addresses detailing plans for the new year, was handled by a committee consisting of Eugene Farmer, William LaRue, Ralph Goldsmith and Harry Fowler, and the talent was furnished exclusively by the Howard employees. More than 75 were present.

Roy Galway, St. Louis representative of Rolls-Royce, has announced the opening of his new salesroom at 2940 Locust street. Since coming to St. Louis in October to represent the company Galway has displayed models in the lobby of the Chase Hotel. C. A. Mendhand, who was connected with Rolls-Royce in Derby, England, later with the American factory at Springfield,

Mass., is being brought to St. Louis as service manager.

The Peedee Motor Co. has been organized and incorporated to handle automobiles and equipment at Bishopville, S. C., with N. Y. Alford, of that place, as president, and W. A. James, secretary and treasurer.

The Western Auto Supply Co. of Kansas City, Mo., gave \$3,000 in checks to its employees Christmas. Heads of departments also were given checks from the company by Don A. Davis, president.

The new building of the Ungar Buick Co. of Miami, Fla., will be erected in the city of Miami instead of in Lemon City, a suburb, as recently stated in Motor Age. The new building, together with ground, will involve an expenditure of about \$160,000, and is planned by A. A. Ungar, president of the company, as a permanent home for his business. It will be modern and complete in every respect.

Lonnie Ward and Reo Ward, who moved to Bethany, Mo. recently from Gilman City, have opened a Harrison county agency for the Overland and Willys-Knight Cars, and will operate under the name of Ward Brothers.

The Mason Motor Company has been incorporated at Monett, Mo., by W. S. Taylor, Leslie L. Mason and James E. Sater, with a capital of \$40,000.

The Franklin Motor Car Co., St. Louis Franklin distributor has occupied an additional building at 2214 Locust street, across the street from its salesroom at 2217 Locust street, for the purpose of a used car rebuilding department and used car salesroom.

Lewis F. Batchelor and Eugene Dell have announced that they have contracted to purchase the good will, accessories and equipment of the Wilson Garage, conducted by J. E. Cook, 511-519 Wilson street, Baltimore.

The R. P. Galbraith Motor Co., which operates a garage in Rock Island, Ill., has leased the entire lower floor of the new Eagles building, Fourth and Scott streets, Davenport, Iowa, and established a Rickenbacker and Oldsmobile agency there in addition to the general garage business.

The Biehl-McGowan Motor Co. of Dyersville, Ia., has been incorporated with \$25,000 capital to deal in cars and accessories.

A new automobile building costing about \$300,000, and one of the largest in the two Carolinas, is being constructed at Asheville, N. C., for the Asheville Overland-Knight Co., of which Oscar M. Johnson is president. The building will be four stories, and provide 100,000 square feet of floor space.

R. H. Cutter and A. H. Ragsdale have formed a partnership in Atlanta and established a new retail agency handling the Maxwell and Chalmers line at 322 Peachtree street. Ragsdale has been distributor of Republic trucks in the Atlanta territory for some years.

George King, who has been Velie agent in Burlington Iowa, has joined forces with C. H. Mason, Galesburg, Ill., in the Cadillac and Velie Co., and will add the Cadillac to his Burlington line. He will occupy the room of the former Burlington Cadillac company at 317 North Sixth street.

C. M. Phelps has sold his interests in the Branham & Phelps Motor Company at Bethany, Mo., to Jesse Branham and Leland Blodgett, the other firm members, who will continue the business. They will retain the county agency of the Chevrolet cars, but the Buick agency, which was held by Phelps, is controlled by Phelps & Spencer of Maysville, Mo., who will sell it to someone else. Phelps says he is retiring completely from the automobile business.

The Springfield (Ill.) Automobile Dealers Association has elected officers for the year as follows: R. R. Haas, president; J. L. Elliott, vice-president; C. R. Constant, treasurer and W. G. McCloskey, secretary. All had previously served in those capacities.

Arrangements have been made with the Cole Sales Service Company in Kansas City, Mo., to distribute the entire line of Cole motor cars in the Kansas City territory. Temporary quarters have been established at 1729-31 McGee street.

Record Attendance Justifies Moving Show to Bronx Armory

New Location Proves Not to Be Barrier to Public Interest—Crowds Increased Daily

NEW YORK, Jan. 11.—Up to Thursday the crowds attending the twenty-fourth annual New York show in the Bronx Armory were greater than the record attendance for the corresponding period last year at the Grand Central Palace. Given a continuation of favorable weather, all previous records for show attendance should be shattered by the end of the week.

This showing at the gate justifies the radical action of the directors of the National Automobile Chamber of Commerce, acting on the advice of Show Manager Samuel A. Miles, in abandoning the Forty-second street district and taking the show north to 193d street, a move which when first announced was received with skepticism by many manufacturers and dealers. The pessimists feared that the public would not follow the show into the Bronx, but the box office reports show that the N. A. C. C. directors made a most successful analysis of the possibilities of the new location.

Cold Wave Does Not Stop Them

Even on the first day it was apparent that the public had been well sold on the Bronx Armory, despite a cold wave that sent the mercury down to zero, for the crowd then was greater than the opening day at the Palace a year ago. Since then the daily attendance has increased day by day until last night when there was a crowd in the big building that could not have been jammed into the Palace with a shoe horn.

Approval of the Bronx Armory as the ideal building for a national automobile show comes not only from the manufacturers themselves, who for the first time find themselves with sufficient space in which to properly display their products, but the New York distributors and dealers unite in their approval of the change. They say there is a noticeable difference in the caliber of the present show crowds. Those who jam the Armory these days and nights are not mere sightseers—they go there with the idea of either buying now or looking over the cars with serious intentions of buying later on. They show far more knowledge of motor car construction than did the crowds of previous years and if the show does not prove to put new life into the retail selling field it will be surprising.

Parking space for 3000 cars has been a feature that undoubtedly has helped swell the box receipts, for this has been taken advantage of by thousands of New Yorkers and residents of Westchester County who find it far easier to drive to the show than it was to go to the Forty-second street district by subway in previous years.

MAINE JOINS N. M. A.

WASHINGTON, Jan. 10.—The Maine State Automobile Association, one of the largest motoring organizations in the United States has been granted a char-

ter and has become affiliated with the National Motorist Association, according to announcement just made by the national headquarters of the latter association located here.

CONCERNING MEN YOU KNOW

E. S. Marlow, formerly of Coventry, England, has joined the staff of the George W. Davis Motor Car Co., of Richmond, Ind., as general production manager. Mr. Marlow has had a broad experience in the automobile industry in England, extending over a period of more than 20 years, in the course of which he has been associated with many of the leading motor car manufacturers of England, including Arrowl-Johnston, Standard and Hemblar.

Walter L. Prack, secretary of the Ward Motor Co., St. Louis distributors of the Maxwell, Chalmers and Chrysler cars, has been named retail sales manager of the company and will handle the retail sales in addition to his secretarial duties. S. B. Ward, president of the company, will continue in the capacity of its general manager.

C. E. Geiger, who has been with the Overland Motor Co. of Chicago for a number of years, has been appointed wholesale manager of the St. Louis branch of Willys-Overland, succeeding David Yantis who resigned recently to accept a position with the Studebaker corporation in Canada.

Alvan Macauley Jr. has recently been appointed Michigan representative for the Firestone Steel Products Co. Wm. A. Baker, the former representative, has been transferred to Akron as sales manager.

Walter H. Roberts, former sales manager of the Willys Light division of the Electric Auto-Lite Co., has been appointed manager of the Kansas City branch of the Willys-Overland Co. He will have charge of wholesale territory embracing Kansas and parts of Missouri, Oklahoma and Arkansas.

Bert Bly of St. Paul is the new manager of the United States Rubber Co. branch at Toledo.

Arthur Hertig has left New York for an extended trip through Norway, Sweden, Denmark, Finland, Holland, Belgium, France and Switzerland. He is in charge of sales in these countries for the Hayes Wheels Co., Automotive Gear Works, McQuay-Norris Manufacturing Co., and the Service Spring Co., and will appoint dis-

tributors for these concerns. Mr. Hertig formerly was export manager of the Chevrolet Motors Co. and later production and assistant sales manager of the General Motors Export Co.

Frank Pritchett, for several years agent for the Dodge car at Nevada, Mo., but who moved to Shreveport, La. two years ago, died in that city recently. The body was taken to Huntsville, Tex., for burial.

J. C. Lynn, formerly chief engineer of the Lexington Motor Car Co., of Connersville, has joined the engineering staff of the Indiana Piston Ring Co., of Hagerstown, Ind., manufacturers of Perfect Circle Oil-Regulating piston rings.

Howard W. Harrington, advertising manager for the Moline Plow Co. for five years, has resigned and joined the H. K. McCaum Advertising Agency. N. O. Dawson, superintendent of the Moline Press, Inc., a printing plant subsidiary of the Moline Plow, has succeeded Mr. Harrington and he will be aided by H. S. Weeks, assistant advertising manager, according to announcement by George N. Peek, president.

J. J. MacDonald has been appointed head of the estimating department of E. S. Evans & Co., Detroit, loading experts. Before joining the Evans company a year ago Mr. MacDonald was assistant traffic manager of Hupp Motor Car Corp. F. L. Seeley, formerly in the purchasing department of Hudson Motor Car Co., has joined the sales staff of the Evans organization.

R. H. Martin, president of the Martin-Nash Motor Co. southeastern distributors of the Nash, announces the appointment of T. K. Johnson, Manager of the factory branch of the General Motor Truck Co. in Atlanta for some time, as a representative of the wholesale department of the Martin company.

John L. Grice, of Atlanta, who has been branch manager for the White Co., at Charlotte, N. C., has been appointed manager of the company's branch at St. Louis, succeeding Eugene Kelly. Mr. Grice was formerly manager of the branch at Jacksonville, Fla.

Special Census Will Show Number of Cars on Farms

WASHINGTON, Jan. 12.—A complete census of all American farms, to be known as the 1924-25 farm census, has been authorized by Congress and will be begun at once by the Department of Agriculture, it has been announced. The bill authorizing the survey also provides that it shall be made every five years and will show a multitude of facts pertaining to the American farmer which will be of use in industrial surveys.

Of particular interest to the automotive industry will be that part of the survey showing the number of automobiles used on farms, and to what extent; the number of tractors, their upkeep, and the amount of land tilled by each machine. The extent to which automobiles and tractors are replacing horses and mules on farms, will also be reflected in the survey which will contain a census of live stock and crop inventories. The work will be under the supervision of W. A. Schoenfeld, Chairman of the Crop Reporting Board.

V. S. DARLING DIES

AUBURN, Me., Jan. 10.—V. S. Darling, head of the Darling Automobile Co., Reo distributor for the greater part of Maine and also head of the automotive equipment wholesale and retail firm of the same name, died yesterday after a brief illness. Mr. Darling was one of the first Reo distributors in the country, opening the Maine territory. He controlled the

entire state until the war period, when he relinquished a number of counties, with Portland as a center, to Myron D. Kidder, a former Reo factory man who had been an executive in the Darling organization. Mr. Kidder has controlled the Portland territory ever since.

Mr. Darling was one of the best known dealers in Maine and had been active in legislative affairs, particularly in the formation of the tentative state organization of dealers which has held a number of meetings and has exerted an influence on legislation.

DEALERS HOLD OWN SHOWS

CLARKSBURG, W. Va., Jan. 12.—Clarksburg Automobile Dealers' Association decided on the week of Feb. 16-23 for their annual automobile show. Each dealer will have his own show in his own place of business, and special events will be arranged for certain nights during the display week. The Association elected the following officers: President, O. Ray Cuppett; vice-president, R. C. Helmick; secretary-treasurer, William Keister.

NEW PEERLESS PRICES

NEW YORK, Jan. 10.—The outstanding feature of the dealers banquet of the Peerless Motor Car Co. at the Astor was the announcement of the prices on the new Peerless six which are as follows:

| | |
|----------------|--------|
| Phaeton | \$1985 |
| Roadster | 1985 |
| Sedan | 2675 |

796,000 Cars Sold by GMC in Twelve Months of '23

Closed Car Gains Steadily in the Favor of the Buyer, Says Report

NEW YORK, Jan. 12.—General Motors sold a total of 796,000 cars in 1923, according to the official report issued this week. Preliminary figures give the December sales as 59,000 cars and trucks as compared with 46,871 actually sold in December, 1922.

"The increase in the sale of motor cars equipped with closed bodies is not generally appreciated," comments the General Motors report. "During 1923 there were sold 267,000 closed cars, or 37 per cent of the total. This compared with 120,000 closed cars, or 28 per cent of the total, in 1922. There was, therefore, an increase of nearly 125 per cent in the number of closed cars sold in 1923 compared with 1922."

The number of cars and trucks sold by months by the United States and Canadian divisions of General Motors in 1923 compared with 1922 follow:

| | 1923 | 1922 |
|-----------------|---------|--------|
| January | 49,162 | 16,088 |
| February | 55,427 | 20,869 |
| March | 71,669 | 34,082 |
| April | 75,822 | 40,474 |
| May | 75,393 | 46,736 |
| June | 69,708 | 48,541 |
| July | 51,634 | 33,772 |
| August | 65,999 | 42,840 |
| September | 69,081 | 35,442 |
| October | 86,936 | 40,815 |
| November | 66,256 | 50,232 |
| December | *59,478 | 46,871 |

*This preliminary figure of sales includes Buick, Cadillac, Chevrolet, Oakland, and Oldsmobile passenger and commercial cars and GMC trucks.

BIGGEST YEAR IN OREGON

PORTLAND, Ore., Jan. 7.—The year 1923 was easily the best in the history of Oregon for new car sales, according to registration figures for the year made public today by Sam A. Kozar, secretary of state and ex-officio head of the motor vehicle department. During 1923 the number of cars in the state increased by over 30,000 over the year before, this being approximately twice the increase experienced during the year before, and one and one-half times the increase of the best previous year in the history of the state, 1920.

OIL DEALERS ORGANIZE

CHARLOTTE, N. C., Jan. 12.—A gasoline and oil division of the Charlotte Automotive Merchants Association has been organized with K. A. Grice, chairman; C. M. Byers, vice chairman and Miss Frances Hendren, secretary. Arthur Wiley was appointed chairman of a committee to draw up a code of ethics and business standards. C. E. Bradshaw was appointed chairman of a publicity committee to look after unified advertising of the organization.

BUSINESS NOTES

Two new bodies for Ford chassis are being displayed by the Champion Body Co., 3147 Locust street, St. Louis. The "Traveler" is a five-passenger coach with removable seats which can be folded down the same as a Pullman car making a full, comfortable double bed and when taken out there is 50 cu. ft. for carrying space for salesmen. The other car is purely a commercial body for salesmen. It is a two-passenger coupe with a rear compartment 40x40x40 in. This latter model has proven popular among shoe salesmen.

Fitzgerald Manufacturing Co. making the Star line of electrical specialties, has let a contract for an addition to its factory at Torrington, Conn. This is to be an extension of the present building of approximately 300 ft. long and two stories high and to be done in April. This addition is only one of several the company is planning.

A voluntary petition in bankruptcy has been filed in the federal court in St. Joseph, Mo., by Aratas Bradfield, who operates a tire shop at 1211 Jule street. Assets are listed at \$2,253.06 and liabilities at \$1,549.26.

The Liggett-Pool Battery Company has been incorporated at Joplin, Mo., by Joseph S. Walker, Frank A. Liggett and John E. Pool.

The R. P. Rice Motor Company has been incorporated at Kansas City, Mo., with a capital of \$100,000 by R. P. Rice, G. A. Rice and F. K. Schuepbach.

More than 100 jobbers and their salesmen attended a dinner given at Boston Dec. 29, by the Champion Spark Plug Co., of Toledo, to outline plans for 1924. General Sales Manager F. B. Caswell presided. He introduced Professor A. B. Haake, of the University of Michigan, who gave

the details of the finding of sillimanite, and also spoke on "Business Opportunities." R. A. Leighty of London, R. Coluwartz of Paris, O. H. Rhoads, chief engineer from the factory, C. Corwin, district sales manager and O. C. Leighty also gave brief talks.

The A-C Mfg. Co., 2224 West Grand avenue, Chicago, has purchased the patents and materials on hand for Alford springs from Andrew Hoffman & Co. and hereafter will market these springs as A-C auxiliary springs for Fords. They will be sold through A-C brake distributors.

Toledo automotive leaders have joined in forming the Belden Engineering Co., which has been capitalized at \$100,000 and which will engage in the development of a number of ideas in new automobile and appliance design. Clement O. Miniger, president of the Electric Auto-Lite Co., is president of the new company. E. H. Belden, for many years chief engineer of the Willys-Overland Co. and responsible for many of the most successful features of Overland design, is the vice-president and H. C. Tillotson, president of the Tillotson Manufacturing Co., maker of carburetors, is secretary-treasurer. Offices have been opened in the Spitzer building, Toledo, O.

On petition of four stockholders the Circuit Court has appointed C. C. Carson receiver for the Standard Crate & Filler Co., Jefferson City, Mo., of which one division is the J. M. Hays Wood Products Co., manufacturer of Hickory Hitter automobile bumpers. The receiver states that it appears the quick assets of between \$160,000 and \$200,000 are very much in excess of all current liabilities. The receiver was authorized by the Court to continue the factory in operation. The action of the stockholders was described as a friendly one for the best interests of the company.

50 Per Cent Increase in License Fees in Arkansas

Some Trucks Pay 400 Per Cent More—Gasoline Taxed 4 Cents a Gallon and Oil 10 Cents

LITTLE ROCK, Jan. 12.—Arkansas motorists began Jan. 1, to pay automobile license taxes averaging 50 per cent more under the new highway law, than in 1923. Truck licenses are increased 50 per cent on one ton and as high as 400 per cent on six ton trucks. In 1923 the tax on six ton trucks with either pneumatic or solid tires, was \$150. Under the new law, the tax is \$400 for six ton trucks on pneumatic tires and \$600 with two or more solid tires. The tax for two or more solid tires is 50 per cent more than pneumatic tires, on all but the one ton trucks. In the one ton the tax is the same on both.

Automobile licenses are increased on an average about 45 per cent. Ford cars are \$16, against \$11 last year; Dodge \$22 against \$14 in 1923; Buick \$25 against \$16, and Cadillac is \$29 against \$19.

The revenue is expected by experts in the State Highway department to produce an average of \$20 a car on a total of 142,000 cars in 1924. The revenue for 1923 was approximately \$1,689,000 on 112,000 cars. If the figures of the experts are correct Arkansas will have \$2,840,000 to spend on good roads for 1924, less a portion set aside for bonds already issued.

In addition to the license tax on motor cars, there is a 4 cent tax on gasoline and 10 cents on motor oil. This is expected to greatly increase the funds for road building and upkeep.

STOLEN CARS RETURNED

COLUMBUS, O., Jan. 14.—Of the 511 automobiles stolen in Columbus in the past year, all but 25 have been recovered, according to records in the office of John W. Davis, at police headquarters. These figures show, according to detectives who have charge of investigating the thefts of automobiles, that the stealing of machines is not a prosperous business in Ohio's capital city.

CASWELL, LONG RECEIVER

HARTFORD, Conn., Jan. 14.—Judge William M. Maltbie of the Superior court has named William M. Caswell of Boston temporary ancillary receiver of the R. H. Long Motors Co., of Framingham, Mass., builders of the Bay State car, with branches in Hartford, Waterbury, New Haven, Bridgeport, Danbury, New London and Stamford of this state.

NEW MANAGER FOR MARKET

SALT LAKE CITY, Utah, Jan. 10.—The management of the Certified Public Used Car Market, established by local dealers two or three months ago, is now in the hands of N. E. De Groff, who has been in charge of the Universal Sales Co. of this city, a Ford concern, for the past four years.

Army to Build Airplane With Speed of 280 M.p.h.

WASHINGTON, Jan. 12.—Plans have been approved and actual work will begin at once on the construction of an airplane, whose maximum speed will be 280 miles an hour, to be built at the McCook Field, Dayton, Ohio, for the Army Air Service and to be the entry of the Air Service in the Pulitzer trophy races at Wilbur Wright Field, near Dayton, in September.

The plane is expected to be able to break the record made by the Naval Air Service when Lieut. A. J. Williams last October at St. Louis flew 243.67 miles an hour. An important problem being worked on in connection with the racing plane, which aeronautical engineers and experts say will unfold a new field for high-powered racing motors, is that of developing a motor with cylinders pointing downward as well as upward.

Fred Verville, noted aeronautic expert, has been designated by Maj. Gen. Mason M. Patrick, chief of the Army Air Service, to build the new ship which will be a departure from the Curtiss biplane type and the Verville-Sperry thick-winged monoplane with a retractable landing gear.

1000 WILLYS DEALERS BANQUET

NEW YORK, Jan. 10.—More than 1000 dealers attended the banquet of the Willys-Overland Co. at the Biltmore Hotel last night when addresses were made by President John N. Willys and Sales Manager L. G. Peed. Mr. Willys outlined the growth of the company since its inception and announced a schedule of 165,000 cars for the first six months of this year.

400 DEALERS AT LUNCHEON

NEW YORK, Jan. 11.—More than 400 dealers attended the luncheon of the Franklin Automobile Co., held Wednesday in the grand ball room of the Commodore and presided over by Sales Manager S. E. Ackerman. A feature of the affair was the introduction to the dealers of J. W. Gould, the new Franklin general manager. Following this those dealers who had won national prizes during the past year for their sales efforts were presented. Chief of these was Ralph Hamlin of Los Angeles, who led the dealer field with 135 more car sales than his closest competitor.

NEW VELIES SHIPPED

MOLINE, Ill., Jan. 12.—Shipments of the new Velie 56 began this week and the factory has been placed at full production capacity six days a week to meet the demand for the new cars. Three thousand orders were booked almost upon the introduction of the model and more than 400 dealer inquiries came in the first two weeks of the year. The Avenue Motors Co., Cleveland, Ohio, which drove the first car overland in sub-zero weather, reported 595 miles on 22 gallons of gas and a quart of oil.

CHARLES W. WRIGHT DIES

MOLINE, Ill., Jan. 12.—Charles W. Wright, organizer of the Moline Body Corporation, and until his retirement a few years ago, in charge of the Banner Buggy Co. in St. Louis, died Monday at his home here. He was 74 years old. Mr. Wright was a superintendent in the Sechler Carriage Co. until 1902 when he organized the Wright Body Co., now the Moline Body Corporation, and was active in its management four years.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

| | | | | | |
|--------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------|--------------------------------------------------------------------------------------------------------------|
| Akron, Ohio..... | February | Automobile Dealers Co., Frank O. Neill, Manager. | Madison, Wis. | Feb. 7-10 | Madison Automotive Dealers' Association, O. S. Jacobson, Chairman. |
| Albany, N. Y..... | Feb. 16-23 | Albany Automobile Dealers' Association, J. B. Wood and L. Y. Long, Managers. | Mankato, Minn..... | Feb. 27-Mar. 1 | Mankato Automobile Dealers' Association, E. J. Dillman, Secretary. |
| Albuquerque, N. M..... | Feb. 7-9 | Albuquerque Automobile Trade Association, E. G. Fuhrmeyer, Secretary. | Middletown, N. Y..... | Feb. 5-9 | Middletown Automobile Dealers' Association, Callahan and Partlan, Managers. |
| Allentown, Pa. | March 1-8 | Lehigh Automobile Trade Association, E. T. Satchell, President. | Milwaukee | Jan. 19-26 | Milwaukee Automotive Dealers' Association, Bart J. Ruddle, Manager. |
| Atlanta, Ga..... | Feb. 16-24 | Atlanta Automobile Association, Virgil W. Shepard, Manager. | Milwaukee, Wis..... | Aug. 25-30 | Milwaukee Automotive Dealers' Association, Fall Show, Bart L. Ruddle, Manager. |
| Atlantic City, N. J..... | Feb. 2-9 | Annual Atlantic City Automobile Show, E. M. Antrim, Chairman. | Minneapolis, Minn..... | Feb. 2-9 | Minneapolis Automobile Trade Association, Walter R. Wilmot, Manager. |
| Baltimore | Jan. 19-26 | Baltimore Automobile Dealers' Association, John E. Raine, Secretary. | Montreal, Canada..... | Jan. 19-26 | Montreal Automobile Trade Association. |
| Beaver, Pa..... | Jan. 23-26 | Beaver County Automobile Dealers Association, James W. Lehigh Valley Automobile Show. | Muskegon, Mich..... | March 4-8 | Muskegon Automobile Trade Association, J. C. Fowler, Manager. |
| Bethlehem, Pa. | March 23-29 | Lehigh Valley Automobile Show. | Newark, N. J..... | Jan. 12-19 | New Jersey Automobile Exhibition Co., Claud E. Holgate, Manager. |
| Binghamton, N. Y..... | Feb. 4-9 | Annual Show, L. M. Napper, Chairman. | Oakland, Cal..... | Jan. 12-19 | Alameda County Automotive Trades Association, Robert Martland, Manager. |
| Boston, Mass..... | March 8-15 | Boston Automobile Dealers' Association and the Commercial Motor Vehicle Association, Chester I. Campbell, Manager, 5 Park Square. | Oklahoma City, Okla..... | March 24-29 | Oklahoma City Motor Car Dealers' Association, E. T. Bell, Secretary. |
| Brooklyn | Jan. 19-26 | Brooklyn Motor Vehicle Dealers' Association. | Omaha, Neb. | Feb. 18-23 | Omaha Automobile Trade Association, A. B. Waugh, Manager. |
| Buffalo | Jan. 12-19 | Buffalo Automobile Show Committee, Carlton C. Proctor, Manager. | Orlando, Fla..... | Feb. 12-16 | Subtropical Midwinter Fair Association, C. E. Howard, Manager. |
| Burlington, Vt..... | April 2-5 | Ethan Allen Club, Thomas W. Parkhill, Chairman. | Patterson, N. J..... | Jan. 28-Feb. 2 | Patterson Automobile Trade Association, Harry Durkin, Manager. |
| Calumet, Mich. | April | Central Storage Co., Jos. A. Savini, Manager. | Philadelphia | Jan. 12-19 | Philadelphia Automobile Trade Association, W. H. Metcalf, Manager. |
| Camden, N. J..... | March 3-8 | Camden Automobile Trades Association, M. T. Ivins, Manager. | Pikeville, Ky..... | Jan. 17-19 | Eastern Kentucky Automobile Show, F. W. Ruddy, Secretary. |
| Charlotte, N. C..... | March 3-8 | Charlotte Automotive Trades Association, George E. Wilson, Chairman. | Portland, Me..... | Feb. 25-March 1 | Portland Automobile Dealers' Association, Howard B. Chandler, Manager. |
| Chicago | Jan. 26-Feb. 2 | N. A. C. C. National Show, Coliseum and First Regiment Armory, S. A. Miles, Manager. | Portland, Ore..... | Feb. 9-15 | Automobile Dealers' Association of Portland, Ralph J. Steahli, Manager. |
| Chicago | Jan. 26-Feb. 2 | Annual Salon, Drake Hotel. | Rochester, N. Y..... | Jan. 21-26 | Rochester Automobile Dealers' Association, S. Park Harman, Manager. |
| Cincinnati | Feb. 9-16 | Cincinnati Automobile Dealers' Association, Harry T. Gardner, Manager. | Sacramento, Cal..... | Sept. 1-10 | State Agricultural Society, C. E. Paine, Manager. |
| Cleveland | Jan. 19-26 | Cleveland Automobile Dealers' and Manufacturers' Association, Herbert Buckman, Manager. | Saginaw, Mich..... | March 4-8 | Saginaw Automobile Dealers' Association, Guy S. Gauber, Manager. |
| Columbus, Ohio..... | Feb. 4-9 | Columbus Automobile Dealers Co., Anson B. Coates, Manager. | San Francisco | Feb. 16-23 | San Francisco Automobile Dealers' Association, G. A. Wahlgreen, Manager. |
| Dallas, Tex..... | Feb. 11-17 | Dallas Automobile Trades Association. | Scranton, Pa. | Jan. 31-Feb. 2 | Scranton Motor Trades Association, Truck Show, Hugh B. Andrews, Manager. |
| Deadwood, S. D..... | Feb. 19-23 | Deadwood Business Club, F. R. Baldwin, Manager. | Scranton, Pa..... | Feb. 4-9 | Scranton Motor Trades Association, Automobile Show, Hugh B. Andrews, Manager. |
| Denver, Colo..... | March 11-15 | Denver Automobile Dealers' Association, F. F. Vic Roy, Manager. | Sioux Falls, S. D..... | Feb. 6-10 | Sioux Falls Automobile Association, John P. Bug, Manager. |
| Des Moines, Ia..... | Feb. 25-March 1 | Des Moines Automobile Trades Association, C. G. Van Vleet, Manager. | Springfield, Ill..... | Jan. 24-26 | Springfield Automobile Dealers' Association, Basil W. Ogg, Manager. |
| Detroit, Mich..... | Jan. 19-26 | Detroit Automobile Dealers' Association, H. H. Shuart, Manager. | Springfield, Mass..... | March 3-8 | Springfield Automotive Dealers' Association, Harry W. Stacy, Manager. |
| Elmira, N. Y..... | Jan. 21-26 | Elmira Automobile Merchants' Association, T. W. Keeton, Manager. | St. Louis..... | Feb. 17-24 | St. Louis Automobile Dealers' Association, Robert E. Lee, Secretary. |
| Goldsboro, N. C..... | April 21-26 | Chamber of Commerce, W. C. Denmark, Manager. | Syracuse, N. Y..... | Feb. 25-March 1 | Syracuse Automobile Dealers' Association, C. H. Hayes, Manager. |
| Grand Rapids, Mich..... | Feb. 25-March 1 | Passenger Car Dealers' Association, M. D. Elgin, Manager. | Toledo, Ohio..... | Feb. 4-9 | Toledo Automotive Trades Association, H. V. Buelow, Manager. |
| Great Falls, Mont..... | March | Montana Automobile Distributors' Association, Lyman E. Jones, Manager. | Toronto, Ont..... | Aug. 23-Sept. 6 | Canadian Automotive Equipment Association and the Automotive Industries of Canada, Gib Robertson, Secretary. |
| Green Bay, Wis..... | Aug. 25-30 | Automotive Division, Association of Commerce, W. F. Kerwin, Manager. | Troy, N. Y..... | Feb. 2-9 | Troy Automobile Dealers' Association, Frank M. Baucus, Manager. |
| Greenville, S. C..... | Feb. 25-March 1 | Greenville Chamber of Commerce. | Washington, D. C..... | March 8-15 | Washington Automotive Trade Association, Walter Lambert, Secretary. |
| Hackensack, N. J..... | Jan. 12-19 | Automotive Trade Association of Bergen County, Moe Katzman, Manager. | Washington Hgts., N. Y..... | March 26-31 | Washington Heights Automobile Dealers' Association, H. G. Stiles, Manager. |
| Hartford, Conn..... | Feb. 16-23 | Hartford Automobile Dealers' Association, Arthur Fifoot, Manager. | Waterbury, Conn..... | Jan. 14-19 | Waterbury Automotive Dealers' Association. |
| Huntington, W. Va..... | Feb. 24-29 | Huntington Automobile Dealers' Association, G. B. Roberson, Manager. | Wilmington, Del..... | Jan. 28-Feb. 2 | Wilmington Automobile Trade Association, Daniel P. Buckley, Chairman. |
| Indianapolis | March 3-8 | Indianapolis Automobile Trade Association, John B. Orman, Manager. | Yonkers, N. Y..... | March 3-8 | Automobile Merchants' Association of Yonkers, Callahan and Partlan, Managers. |
| Kansas City, Mo..... | Feb. 9-16 | Kansas City Motor Car Dealers' Association, George A. Bond, Secretary. | Youngstown, Ohio | Feb. 25-March 1 | Youngstown Automobile Dealers' Association, C. A. Baird, Manager. |
| Lima, Ohio | Feb. 19-23 | Lima Automobile Merchants Association, R. H. Phillips, Managers; W. H. Powell, Secretary. | | | |
| Louisville, Ky..... | Feb. 18-23 | Louisville Automobile Dealers' Association, George T. Holmes, Secretary. | | | |

CONVENTIONS

Albuquerque, N. M. May 26-31.....U. S. Good Roads Exhibition.
 Chicago Jan. 14-19.....Good Roads Show.
 Chicago Jan. 29-30.....Annual Convention of the National Automobile Dealers Association.

Chicago Jan. 30-31.....Annual Meeting of the Automotive Electrical Service Association.
 Detroit, Mich. Jan. 23.....Annual Convention of the Michigan Automotive Trade Association.
 Detroit, Mich. Jan. 22-25.....S. A. E. Annual Meeting.
 Montgomery, Ala. Jan. 21.....Annual Meeting of the Alabama Automotive Trades Association.

Dodge Dealers Received in New Style at N. Y. Show

NEW YORK, Jan. 14.—Dodge Bros. dealers attending the New York show were introduced to an entirely new style of show week reception, the company establishing in its usual show week headquarters, the Pennsylvania roof, a temporary office of each of its departments having relations with dealers, with the invitation that the dealers use these to acquaint themselves fully with all of its policies affecting them.

Each of the executive officers in charge of these company departments was in personal attendance each day and very frankly discussed any policy with any dealer seeking enlightenment or information. In addition company plans for dealer co-operation and assistance during the coming year were fully detailed, practically through individual contact, instead of through speeches at a general meeting as at previous shows.

The headquarters had the general aspect of an exhibit, with the departments marked off by specially designed pillars and hangings, created by Joseph Urban. It was maintained for the first four days of the show, being open only between the hours of 10 a. m. and 4 p. m. with a buffet luncheon served at noon to the dealers attending each day. The same program will be followed during the weeks of the Chicago and San Francisco shows. The entire dealer organization is expected to attend one of the exhibits according to territory. About 700 attended during the New York week.

Pittsburgh Show, Feb. 2-9, Promises to Be Biggest Ever

PITTSBURGH, Jan. 14.—Pittsburgh's spring automobile show, an annual event, will be held from February 2 to February 9, according to an announcement made here by the Automotive Association, Inc., under whose auspices the exhibit will be held. The 1924 show will be the 28th display held here by the association and will be housed in the place of former years, Motor Square Garden.

John J. Bell, as formerly, will be general manager, and he has assured both dealers and public that the spring affair will be the "biggest and best" ever held here.

Pittsburgh automobile dealers have thronged to New York for the big show there and the local exhibit will follow closely upon that exhibit and the one in Chicago, opening the night the Chicago show closes.

Many factory officials on their way east from Chicago will stop off for the Pittsburgh show and many of the accom-

paniments of the New York and Chicago exhibits will be rushed here. Pittsburgh has come to be recognized as one of the most important automotive distributing points in the country.

Everybody Happy When No One Talks at Banquet

NEW YORK, Jan. 10.—Following precedent there were no speeches last night at the annual banquet at the Astor of the Motor and Accessory Manufacturers Association. Instead, the 600 guests enjoyed the entertainment provided by Sidney S. Meyers, counsel for the association. This entertainment consisted of a special program in three parts, entitled "In Clover," bringing together a galaxy of stars of grand opera, concert and musical comedy, making the most elaborate affair in the history of the association.

John Charles Thomas, the baritone; Jean Gerady, the Belgian 'cellist, and Suzanne Keener, the coloratura soprano of the Metropolitan Opera Co., starred in the musical end of the program, while in a lighter vein W. C. Fields, the comedian co-star of "Poppy," amused the parts makers, while the finale was the presentation of the entire second act of "Mr. Battling Butler" from the Selwyn Theater.

CLASS JOURNAL OFFICE MOVED

DETROIT, Jan. 12.—The Detroit office of Class Journal Co. is now at 7338 Woodward Ave., the change from the former office at 317 West Fort St., having been made during the past week. The new offices are close to the geographical center of the city at Woodward avenue and Grand Boulevard and afford larger quarters. Both editorial and business offices are now at the new address.

WESTON IS CHAIRMAN

NEW YORK, Jan. 10.—J. C. Weston has been elected chairman of the board by the directors of the Ajax Rubber Co. Mr. Weston will continue as president of the company. E. L. Fries was elected secretary in addition to treasurer and G. E. Shipley, formerly assistant to the chairman, was made vice-president and general manager. The company finished 1923 with no bank loans outstanding, it was announced.

APPERSON AGAIN CUTS PRICE

NEW YORK, Jan. 14.—A second reduction of prices applying only to the six-cylinder models has been announced by the Apperson Brothers Automobile Co. The phaeton has been reduced to \$1395 and the sedan to \$1995.

E. H. Heller Addresses A. M. A. on Business Prospects for '24

CHICAGO, Jan. 11.—The Chicago group of the Automotive Manufacturers' Association at its meeting last week was addressed by E. H. Heller, president of the Hill Pump Valve Co., on business prospects for 1924. Mr. Heller had personally made an extensive survey of existing conditions and had collected opinions from many reliable sources, both in and out of the automotive industry. His own company manufactures a varied line of automotive products.

Mr. Heller said unsettled conditions in Europe had failed to depress business in general and the automotive business in particular in the United States. He attributed this to the fact that the greater part of the American production is consumed at home. He predicted continuation of prosperity for the automotive industry.

Another speaker at this meeting was Edward F. Feeley, United States commercial attache at Buenos Aires, who discussed the possibilities of the Argentine as a market for automobiles and automotive accessories. He said that out of a total of 90,000 cars in the country, 70,000 are registered in Buenos Aires. Importation for 1924, he said, probably would average 2,400 cars a month, and he expected most of these to be American makes.

South Dakota Association Makes Permanent Divisions

MITCHELL, S. D., Jan. 10.—In the belief that more effective work could be done, the Automobile Trades Association of South Dakota, at their convention held here in December, decided to divide the association into permanent divisions, consisting of car dealers, garage, service, batteries and ignition, and tires and vulcanizing. It is planned to prepare special programs during 1924 and to present special features at the next annual convention.

Addresses were made by Clyde Jennings, editor of MOTOR AGE, who talked on "The Transportation Store"; Paul Brophy of Percy Chamberlain Associates, Inc., who explained the Appleby Used Car Plan; T. J. Welch, secretary of the South Dakota Association, who talked on "Automobile Credit" and John J. Fuchs, Jr., president of the Midwest Regrinders Association, on "Motor Rebuilding."

All officers and directors were re-elected.

ROLLIN DEALERS MEET

NEW YORK, Jan. 15.—The distributors and dealers luncheon of the Rollin Motor Car Co. of Cleveland at the Commodore today was attended by more than 200.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Cotter Pins in the Crankcase May Short the Magneto

Q—What is the most common trouble when the Ford magneto fields go wrong? If one or more of the coils are grounded can the faulty ones be located? Give complete tests and method of repairing.—A. R. Lotze, Hockanum, Conn.

Among the prominent causes of the derangement of the magneto field coils in the Ford are carelessness in assembly and injury through the coils on the field spool coming in contact with some metallic part of the car. Among the specific causes due to carelessness in assembly or maintenance operations are cotter pins and steel shims, etc., being dropped in the crankcase.

There are several ways of locating a faulty coil but in giving this data we would like to have you understand the difference between a grounded coil and one having a slight ground. For instance it is possible that the insulation between the layers of copper ribbon of each individual coil is broken down to some extent which would not produce a ground when tested.

If charging the magnets from an outside source does not revive the magneto, it is conclusive proof that there is internal trouble and the chances are that it will be found in the field coil assembly.

The Ford magneto field coils, when in normal condition, should draw about 12 amperes at 6 volts. An allowable variation would be about $1\frac{1}{2}$ amperes either way.

We will assume that you have the crankshaft removed and that the magneto field assembly is accessible. The 12 ampere test is made as follows; secure a 6 volt battery and attach two wires to it. One wire will be grounded on the frame of the coil assembly and the other one will incorporate an ampere-meter. The other side of the ammeter will be connected to the terminal of the field coil assembly. With the battery connected in this manner the ampere-meter should indicate 12 amperes with an allowable variation of about $1\frac{1}{2}$ amperes either way. If the reading is less than 10 amperes or greater than $13\frac{1}{2}$ or 14 it is a probable indication of a deranged coil.

The next test is with 110 volts. In this test a lamp is placed in series with 110 volt wires and the normal ground wire of the coil assembly is cut off and detached from the ground connection on the field coil assembly frame. With one side of the 110 volt circuit connected to the detached end of the coil and the other one touching the ground part of the field assembly, that is the frame, the bulb

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

should not light up. If the bulb does light up, it indicates the existence of a ground.

The last test is to determine the location of the ground and is made as follows. With the normal ground of the field coil assembly still disconnected and with the 6 volt battery connected, the grounded or shorted coil should indicate itself by local heating. It may be possible, however, that, with the 16 coils thus connected, there will be insufficient resistance in the partially grounded coil to show up any appreciable heat or smoking.

The next step then, would be to disconnect the connecting strap half way around. That is start at the top of the field assembly and cut the ribbon connecting adjacent coils at the eighth coil from the place where you started. Then make the test as before and, if no smoking or heating shows up, it is proof that the ground or short is in the other set of eight. In this manner you can trace it down to one certain coil but it may be necessary to disconnect several coils.

When you have located the defective coil it should be removed and reinsu-

lated at the point where the ground occurred. The usual location of a ground will be on the outside of the winding or on the inside where it is pressed over the pole piece of the coil assembly.

Ordinary linen tape, similar to the tape used on the original insulation of the coil, can be used to repair the bare spots on the winding. After the tape has been applied the coil winding should be impregnated with shellac and allowed to dry before fastening it to the pole piece on the coil assembly frame.

LEAKY VALVES MAY CAUSE OVERHEATING

Q—Can you tell me direct or through your Clearing columns what the cause and remedy of overheating in a four-months'-old Maxwell Club coupe? The car has always done this. Have gone back to the dealer to no avail. Everything seems O. K., valve timing, spark timing, valve setting (the valve sticks quite often when motor is hot). Muffler clean, passages clean, radiator's circulation seems O. K. No foreign stuff has ever been put in.

Exhaust manifold is red hot when looking down through the heater from the seat. Reaches a temperature just enough to evaporate a gallon of water per 100 miles, regardless of atmospheric temperature or direction of wind. It is impossible to retain alcohol in radiator for cooling. Fan and pitch of blades are O. K.

1—We believe that the cause of overheating lies with the valves. Exhaust valves which leak or stick would cause the exhaust header or manifold to become red hot. As the first step toward the elimination of this trouble remove the cylinder head, clean the carbon, grind the valves and reseat the seats and valve faces if necessary. Examine carefully the valve stems and valve guides and apply a little graphite of the deflocculated type to the valve stems mixed with a little oil.

If the exhaust valves are sticking it is very probable that they also are leaking and as a result of the sticking there will be leakage and probable burning of the seats and valves.

2—Where can I purchase a water pump to fit this car?—R. G. D.

2—If other Maxwell cars will perform satisfactory without the use of a water pump we do not believe that it will be necessary to install a pump on this particular model. However, in case you insist on purchasing a pump, would suggest that you consult your garage or maintenance dealer and he will be able to secure a pump and attachment that can be applied to this car by making a few revisions on the layout.

Garage for Hudson-Essex Dealer

Q—We are having plans developed for a new garage and service station. We are handling the Hudson and Essex line at Akron. The architect is now working on the plans. I am enclosing a sketch of the ground giving dimensions and also showing relation to the streets. The salesroom will be required to hold from five to seven cars. We do not expect to do any storage business. We now have ten men employed in the shop. We carry a stock of parts and accessories of about \$15,000.—J. Grant Hyde, Akron, O.

We have laid out a plan for you for the plot, sketch of which you sent us. We have had some difficulty, however, in making the measurements and angles come out right and we think there must be some slight mistake in the angles given us. However, the difficulty is such that it will not affect the layout to any great extent.

We have reserved a strip across the front, 32 ft. deep, for a showroom. The accessory and parts store is at the rear of the showroom on the side street. Immediately back of this accessory store on the side street is the service entrance to the building, and at the side of the service entrance is the service manager's office, so that cars seeking service will be inspected and taken care of as soon as they enter the building.

The rear section of the room opening from the side street will be reserved for the storage of demonstrators, etc., while the further side will be the repair shop. This repair shop will accommodate about 18 or 20 cars, and still leave plenty of space for a machine shop.

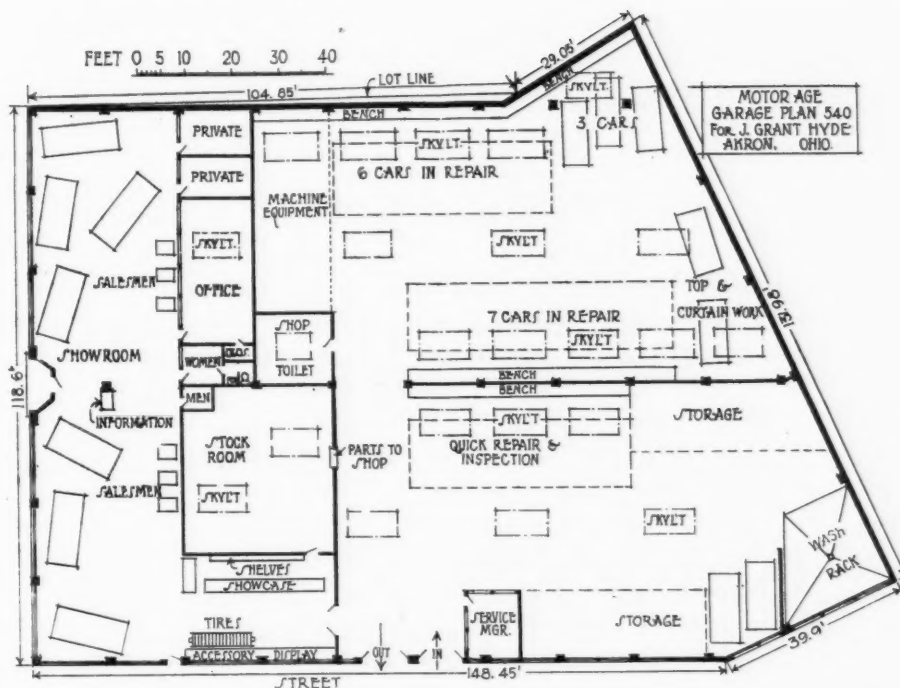
The side of the lot opposite the side street is not parallel to the side street and we would suggest that this irregularity should be disregarded, making the side wall parallel to the one facing the side street. This would sacrifice only one or two feet of ground at the rear, tapering off to nothing at the front and probably would not be worth enough to make so many different length trusses for the back part of the building.

Skylights are indicated to distribute the light evenly throughout the several garage floors and also the office and stockroom. The information desk is placed at one side of the post in the center of the showroom and the information clerk may also be the telephone operator.

PROPER CLEARING IN LAPPING PISTONS

Q—Give information as to the proper clearance to give Ford pistons when lapping in oversize. Give proper clearance both at the top and bottom of the piston, also advise what the proper clearance is on the Fordson tractor pistons when lapping in oversizes. We have had trouble with a sharp clicking in some cases and have overcome it by taking out the piston and lapping it to give more clearance.—G. S. Nutting, Belleville, N. Y.

There is a possibility that with pistons too tightly fitted in the cylinders there is considerable drag, so that with wrist pins loose there would be a knock or click. A more likely cause, however, is in ridges in the cylinder or certain portions of the cylinder smaller in diameter than other portions. Where cylinders



Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

have not been reground or rebored there is always a possibility that half way down the bore the diameter will be less than it is at the top or bottom of the bore. In such a case the piston may pivot on the narrow point and cause a click as it swings first against the upper portion of the cylinder wall and then against the lower portion.

The proper clearance for cast iron pistons is .001 for each inch of diameter. As the Ford diameter is $3\frac{3}{4}$ inches and the Fordson 4 inches, a clearance of .004 would be all right for either one. When we come to the case of aluminum pistons the clearance should be twice as much or .008. In the case of aluminum pistons, however, which have a slit skirt, the clearance may be about the same as for cast iron.

All of these dimensions and clearances apply to the portion of the piston from the wrist pin down toward the bottom, in other words the skirt of the piston. The upper portion between the rings is known as the ring lands and the diameter here is reduced in varying amounts. It is, however, practically always taken care of by the maker of the piston. This means, however, that the lower portion or skirt of the piston should be considered when the clearance is determined. A thickness gauge or feeler can be conveniently used inserted at one side of the piston, and with cast iron pistons and a feeler gauge .004 inches thick the pistons should be capable of being pushed through the bore.

WHAT GOVERNS THE SPARK COIL VOLTAGE?

Q—I have come to the conclusion that the Ford coil produces on the average (20 to 22 m.p.h.) less voltage than the single type coil as used on most all other cars. I would like to know the voltage of each on the average.

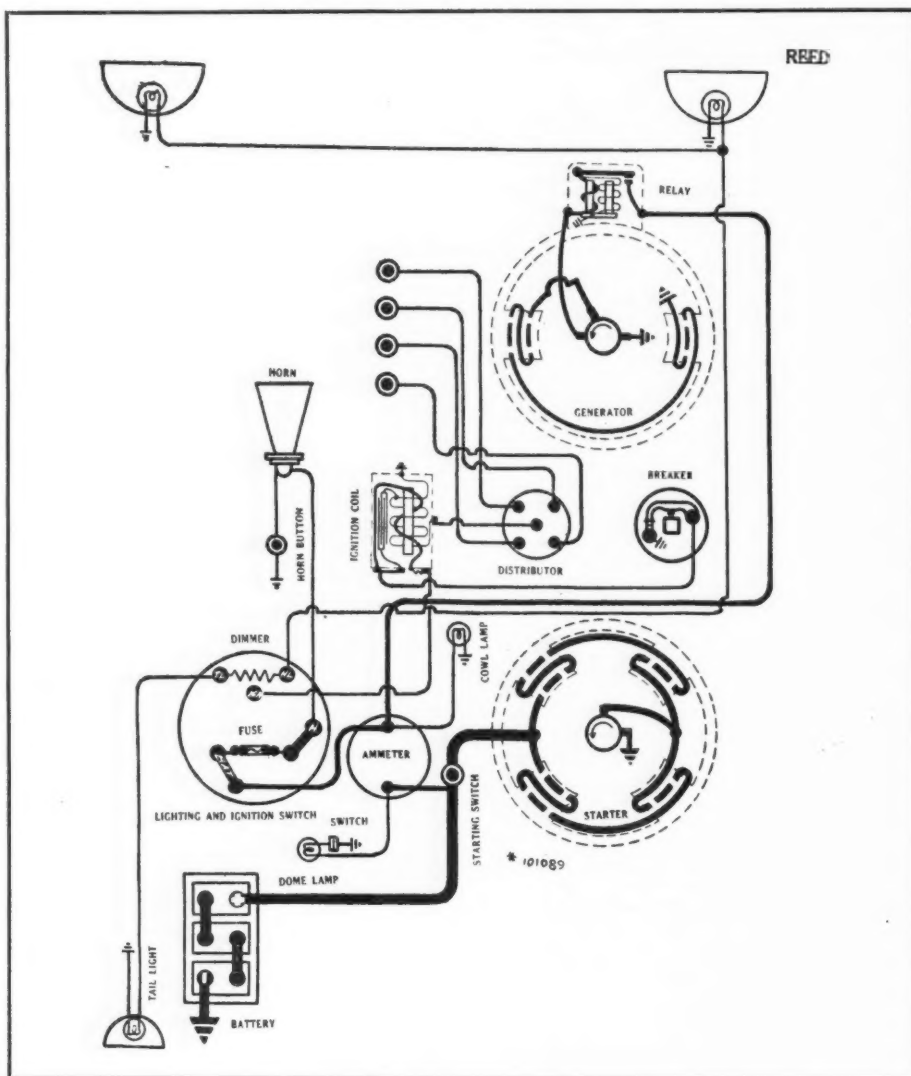
1—The voltage produced by the coil can be determined approximately by seeing how far the spark will jump. A spark that will jump from $\frac{1}{2}$ to $\frac{9}{16}$ inch in air has approximately 10,000 volts. A spark that will jump from $\frac{1}{8}$ to $\frac{3}{16}$ inch has accordingly 3,000 or 4,000 volts and this is sufficient to jump the gap of .025 inch at the plugs under compression.

It is accordingly necessary that a coil be able to produce more than the voltage required but the voltage that is actually produced is determined by the gap in the spark plug and by the compression under which it operates. Another way to look at it is that as soon as the voltage has come up to the point where a spark will jump then the voltage can rise no further for the spark jumps and current flows from the coil and the energy of the coil is dissipated as current instead of as voltage. There is accordingly no comparison such as you suggest.

2—Would like to have name and address of the maker of the Bemus timer. It is a ball bearing contact and used on Ford cars.—L. G. Dutcher, Havre, Mont.

2—This information will be given by letter.

1923 Chevrolet Wiring Can Be Used on Elgin



Q—We have a model E-17 Elgin car here that is to be rewired. We have no diagram of it and the wiring is strewn all over the car. Could you supply us with a wiring diagram, preferably one in which we could use a Chevrolet 1923 switch for ignition and lighting?

1—We are showing the standard Chevrolet wiring diagram for the 1923 Superior model, and this will be all right to use on the Elgin. You will notice that the switch used includes a dimming resistance and that there is but one bulb in each headlamp. On the Elgin car, however, according to our records both large and small bulbs were used in the headlamps. If you wish to continue the use of small bulbs you can do so by discarding the dimming resistance and connecting the small bulbs to the same terminals to which the tail light circuit is connected. Then in the dim position you will have tail light and small bulbs in the headlight while in the bright position you will have tail light and both the small and large bulbs in the headlight.

We do not believe this will be a great disadvantage as you only use the bright headlamps when running on a country road at fairly good speed and the slight amount of current used by the small bulbs would not be much loss. You may, however, be able to secure a switch sim-

ilar to the one used on Chevrolet which is designed to use large and small bulbs in headlamps instead of designed for use with a dimmer.

2—On the same car the speedometer was originally driven from the propeller shaft. We wish to change this, however, to front wheel drive, and have a 60-tooth gear to fasten on the wheel. What size should the small gear be to use on the swivel joint? This car has 33x4 inch tires.—A. J. Jerke, Kaukauna, Wis.

2—To find the number of teeth needed in the pinion you multiply the number of teeth in the big gear by 20 and divide by the tire diameter in inches and also divide by the swivel joint ratio. Multiplying 20 by 60 we have 1,200 and as the tire size is 33 inches we divide 1,200 by 33 and find that 36.5 would give the number of teeth in the pinion if the swivel joint has a 1 to 1 ratio. You will have to take the swivel joint and turn one end of it one revolution and see how far the other end turns.

If the swivel joint has a $2\frac{1}{2}$ ratio then the number of teeth comes 14.3. If you have a 3 to 1 ratio the number of teeth comes 12.2 and if you have a 4 to 1 ratio it comes 9.2. Of course you cannot have a fraction of a tooth so that with the swivel joint above mentioned the number of teeth would be 36 or 14 or 12 or 9.

For further information in regard to calculating the pinion teeth would refer you to the August 2, 1923, issue of MOTOR AGE. The information applies to Stewart-Warner speedometers and is also true for A. C. speedometers.

SEVEN BRUSH GENERATOR WAS USED ON MAXWELL

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Beginning with car serial No. 260801 and up to car serial No. 266401 all cars were equipped with Simms-Huff motor-generator known as S. M. S. -2. This is stamped on the name plate of the generator. These generators have seven brushes and the seventh or odd brush is the regulating brush. This seventh brush regulates the charging rate and takes the place of the regulator on the dash panel. The seventh brush is mounted on the brush ring holding the other six brushes.

To increase or decrease the charging rate it is necessary to loosen the two nuts on the outside front end plate of the generator, these holding the brush holder in position, and with these loosened the entire brush holder can be shifted until the proper adjustment is obtained. The proper charging current is from 8 to 10 amperes at a car speed of 14 to 16 m. p. h.

On a few of the first cars following car No. 260801 the seventh brush was the same in size and construction as the other six brushes. After about 1,000 cars it was found that better results could be obtained by chamfering the seventh brush so that the face was $1/16$ inch wide where it bears on the commutator. Much better contact was made in this way and after being in continual service the brush would wear down so as to seat more perfectly.

It is also advisable to use a heavier spring on the seventh brush than on the other six brushes. It is also advisable in case the shunt connection or pig tail of the seventh brush is the same size as used on the main brushes to cut off all but two of the strands so as to make the connection more flexible and allow the brush to make better contact with the commutator.

It is also well to examine the metal portion of the brush holder to see that it does not extend too far below the fiber ring and cut into the commutator. If this is found to be the case the portion which extends down too far should be filed away. As this is a straight 12-volt system a 12 volt cutout should be used.—Thomas Kirkwood, New Westminster, B. C.

MOTOR AGE wishes to express appreciation for the above information sent to us. It will doubtless be of value not only to Mr. Jeweski but to other subscribers as well.

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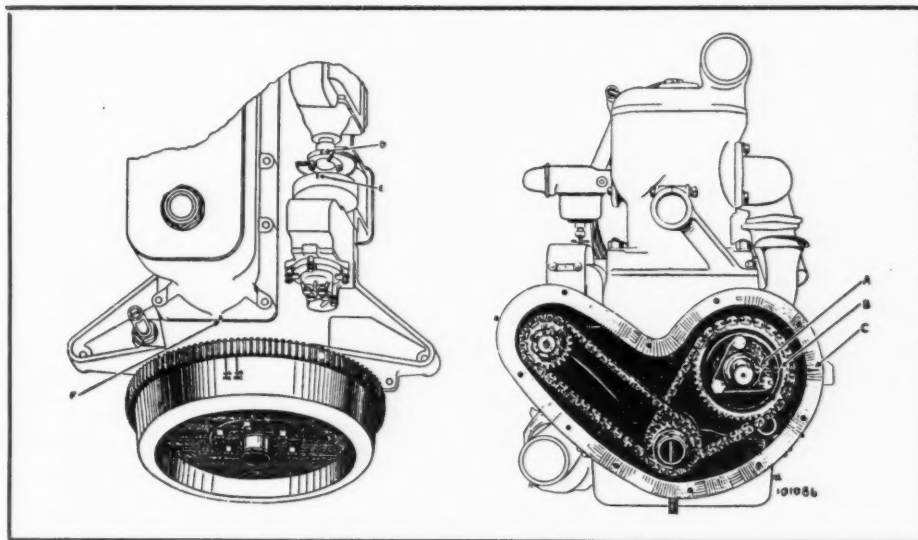
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E-C (exhaust closing No. 1 and No. 4 cylinder), as shown in one of the illustrations, line up with the mark F on the cylinder. With the exhaust manifold removed and a small electric light dropped down through the spark plug hole it should then be possible to detect a small streak of light appearing between the upper edge of the outer sleeve exhaust port and the lower edge of the cylinder exhaust port. If this is the case it shows the timing to be correct. This exhaust closing position should be when the engine is 8 degs. past upper dead center.

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In addition to checking up the valve and ignition timing it would be well to install an up-to-date carbureter for those designed in 1917 are not exactly suitable for handling present day fuel. It is also well if possible to have an intake manifold in which is incorporated a hot-spot feature. Such manifolds can be obtained separately or are supplied by some of the carbureter makers.

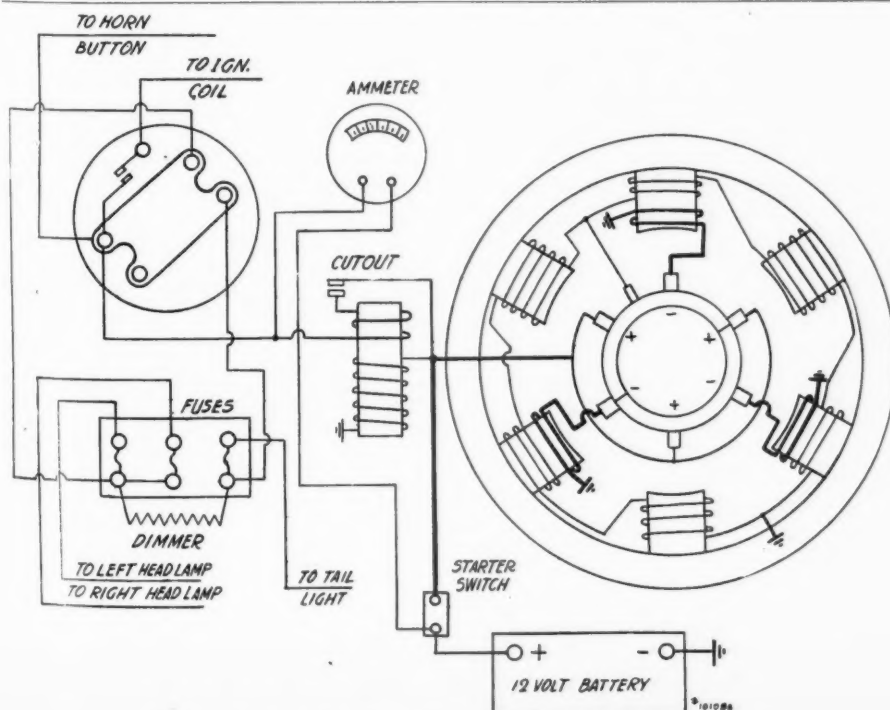
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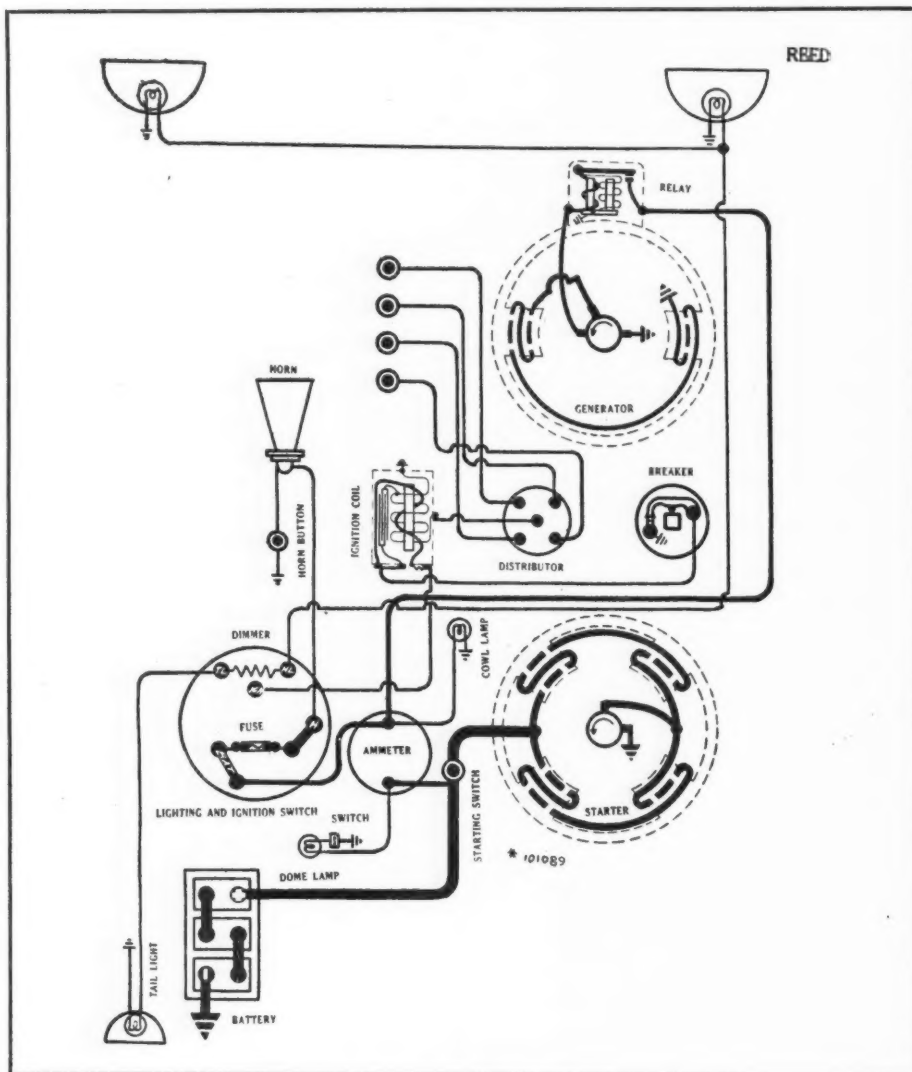
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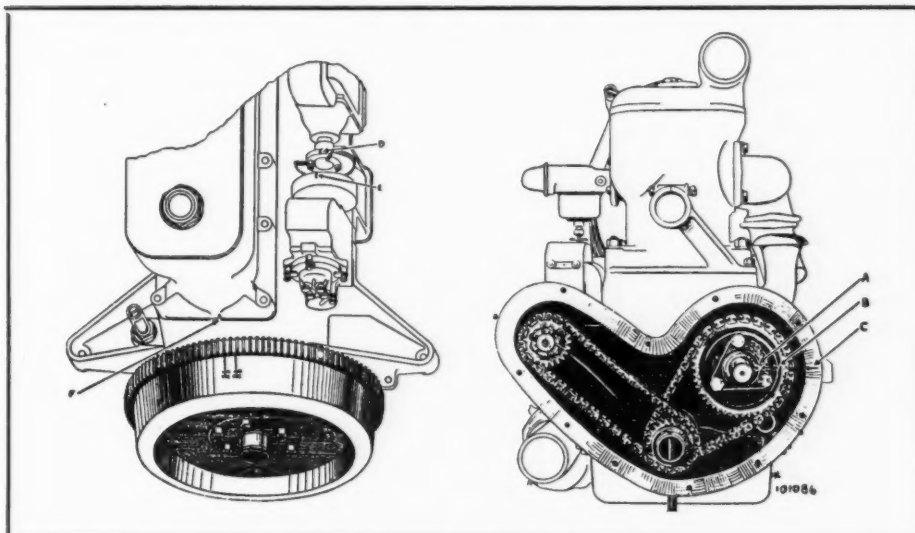
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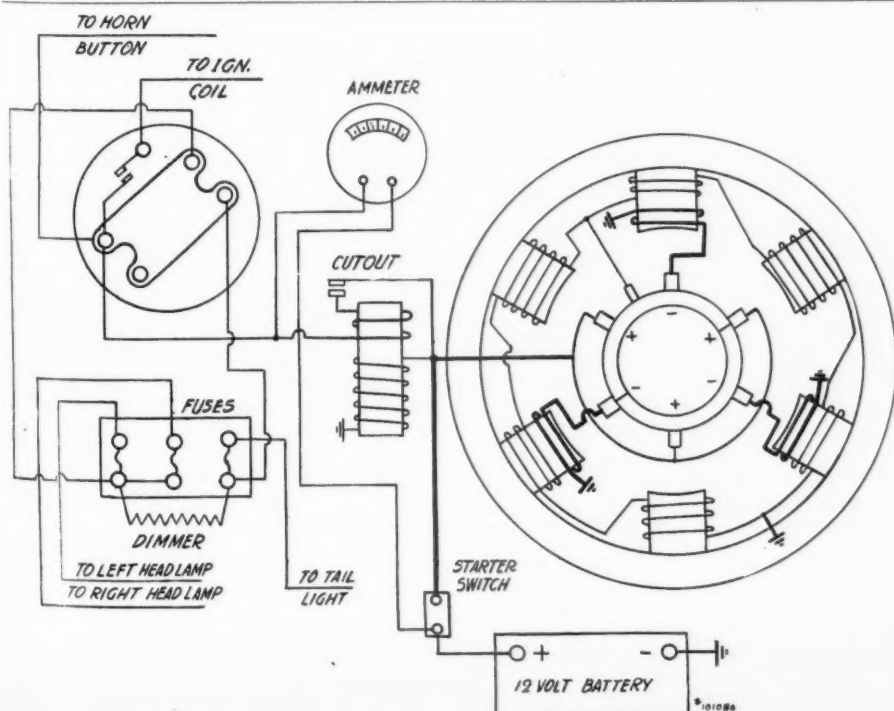
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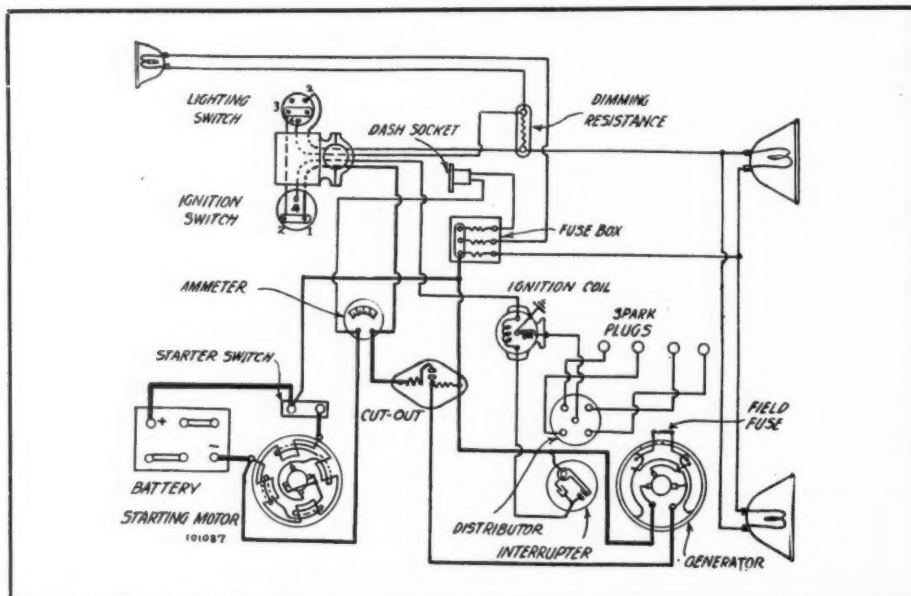
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Wiring diagram for Maxwell cars with seven-brush generator

Wiring of 1921 Reo Speedwagon



Q—We would like to have a wiring diagram of the 1921 model Reo Speedwagon. This truck has been causing considerable trouble due to the ignition. When the generator is cut off the engine runs fairly well, but when the generator is connected it will not run. No doubt there is something wrong with the wiring or perhaps a short in the generator.—Two-Wire Electrician.

We are showing a diagram in accordance with your request and would suggest that you check the generator and ignition circuit. We are not certain as to the cause of the trouble but see one possibility. At the interrupter there is a wire connected from the contact arm up to a heavy black wire just above it. If this short wire should be connected to the other generator terminal instead it would possibly cause the trouble of which you complain.

The stationary contact of the interrupter is connected through the ignition coil and the ignition switch and the ammeter to negative battery while the contact arm is supposed to be connected to the cutout and then through a wire which in the diagram goes up over the

ammeter to positive battery. If this short wire on the interrupter arm were connected to the wrong generator terminal it would do no harm as long as the cutout points did not close for the interrupter arm would get its connection to positive battery through the generator brushes and armature.

However, as soon as the generator would start to produce some current and close the cutout points this short wire on the interrupter arm would then be connected to negative battery and with both ignition leads connected to negative battery we would have no ignition current.

We would suggest checking the generator by removing the field fuse and closely the cutout by hand at which time the armature should draw from 15 to 20 amperes. Then with the cutout points still held down the field fuse should be replaced and this should increase the ammeter reading slightly. At the same time if you snap the fuse in and out you should see sparks, showing that the field circuit is complete.

JUST A HINT ON GENERATOR DESIGN

Q—How are the magnetic lines of force in a generator calculated from the voltage, current and number of turns of wire in a field coil? How many lines of force should a field coil deliver which draws 4 amperes at 6 volts with 300 turns of wire? How many lines of force would be necessary in the field coil of a generator to deliver 5 amperes at 6 to 8 volts and should this magnetic strength be doubled at 10 amperes, and so on in proportion to the current delivered at the same voltage? Show the field winding of a constant potential generator, and explain what it is that governs the voltage as the battery is nearing its full charge. Also advise where commutators and brushes of suitable size to carry from 80 to 100 amperes may be obtained.—Minnesota Subscriber.

The design of generators is a big subject and we may not be able to answer your question specifically but wish to show the general procedure that is necessary in designing a generator.

It is customary to lay out a drawing showing the frame and section of the armature such as we have done in the illustration. Then we have to consider that a single wire would have to cut one hundred million lines of force a second in order to generate one volt. This accounts for having a large number of wires on the armature in series so that each one does not have to generate so much. If we call S the revolutions per second, P the number of poles, N the number of armature wires in series, F the number of lines of force at each pole and V the volts that we want then we have the following formula:

$$V = \frac{S \times P \times N \times F}{100,000,000}$$

We can turn formula around if we want and make it read

$$F = \frac{100,000,000 \times V}{S \times P \times N}$$

We will now start out and assume that we wish to have the machine with 16 slots as shown and with 20 wires per slot. This would give us 320 conductors on the armature but with the average winding there are two paths in parallel so that only 160 conductors would be in series. We would have two poles and will assume that the generator is going to turn 1200 r.p.m. which is the same as 20 revolutions per second.

Our formula then is that

$$F = \frac{100,000,000 \times 8}{20 \times 2 \times 160} = 125,000$$

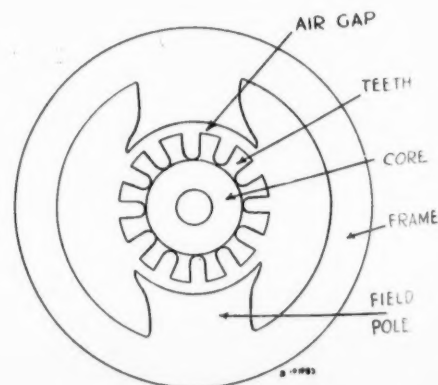
This means that we must have 125,000 lines of force at each field pole in order to generate the 8 volts.

We now come to the question that you ask in regard to the field design. In order to get this number of lines of force to flow across the air gap we must not only figure the ampere turns needed to force it through the air but also the number needed to force it through the teeth of the armature and through the core of the armature, also through the field pole and the frame of the generator. The number of ampere turns are different for all of these different things and they are also different for every voltage and for every different flux or magnetic density.

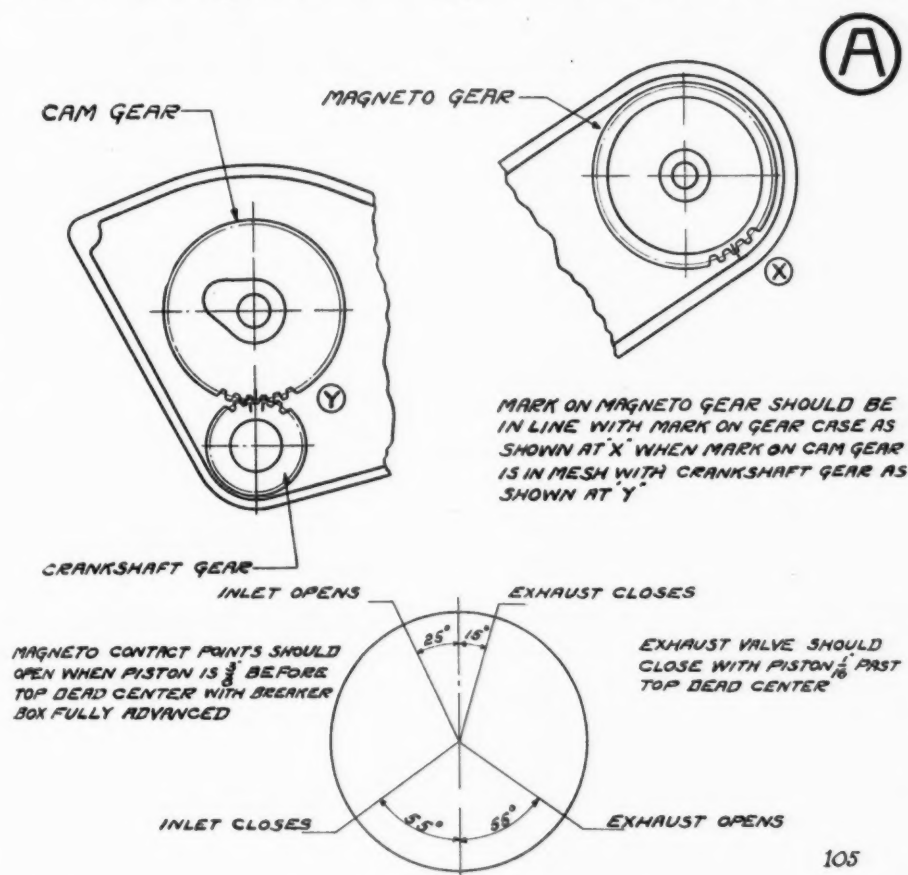
You will notice that in putting slots in the armature which have parallel sides so that the wire will fit in nicely that it leaves teeth, the sides of which are not parallel. In other words they are wider at the top than at the bottom so that the flux or magnetic density will vary through the height of the tooth.

At this point it is necessary to have curves showing the number of ampere turns needed to force the magnetism through one inch of iron at various densities, and it is necessary to take sectional area of all the different parts and figure the densities for all conditions. It is then necessary to add up the ampere turns needed in the various part of the magnetic circuit to find out what current and how many turns the field coil should have.

If you have followed the discussion this far you are probably getting to the point of appreciating that the engineer



Valve and Ignition Timing on Excelsior Motorcycle



Q—How do you time the valve and spark on an Excelsior motorcycle engine No. 58023?

1—Full information regarding timing is given in the illustration.

2—What year was this machine made?

2—1914.

3—Which is No. 1 cylinder when sitting on the machine?

3—When sitting on the machine the No. 1 cylinder is the rear one.

4—What is the crankshaft speed per mile of the Star engine?

4—Assuming a gear ratio of $4\frac{1}{2}$ to 1 and $30 \times 3\frac{1}{2}$ tires the engine will revolve 3,103 revolutions per mile. This of course is assuming that the car is being driven in high gear.

5—What is the brake h. p. of the Star engine?—Illinois Old Timer.

5—35 at approximately 2500 r.p.m.

(Continued from preceding page)

has a job of his own and the next time the temptation comes to condemn the electrical engineer because you have some trouble with the brushes or have an armature burn out you will possibly be a little more lenient than you have in the past.

A good electrical engineer can work out the calculations of a machine in about a week of steady figuring and then his job is done if he checks it up and finds certain conditions to be true. If not he has to take a guess at the starting conditions and do the job all over again. If the relation of certain parts is not correct the brushes may spark, for example, or the armature may overheat or a number of things may happen which make it a poor product to keep running.

Perhaps you begin to see now why we are unable to answer your questions directly for there is no definite answer unless you have an exact drawing of the machine and know all of the electrical engineering specifications. With the average automobile type generator however, it is not necessary to strengthen the field to get more current for this is

accomplished by increasing the speed which generates more voltage and therefore sends out more current. However, if you had a constant speed machine it would be necessary to strengthen the field in order to generate more voltage.

Referring to the Constant potential machine wish to advise that one type uses a series winding which carries the load current. As additional current is taken from any generator it tends to pull the voltage down both due to the demagnetizing effect of current in the armature and to the loss produced by the current flowing through the resistance of the armature.

However, if the same current is made to flow around the field pole in the proper direction it can be made to produce a magnetizing force which will strengthen the generator so as to maintain the voltage substantially constant. This is a method commonly employed. Another method is to have a regulator in the field which varies the field resistance in proportion to the current taken from the machine so as to strengthen or weaken the main shunt winding.

We will gladly answer your last ques-

tion except that we feel it would be well if you would give us some more information as to what you intend doing. If you expect to take an ordinary generator and make a Constant Potential machine out of it by merely changing the commutator and brushes you will without question get into a deal of trouble and if you are figuring on doing this would suggest that you write us and we will give name of concern that might be able to build the machine over for you although on the other hand it might be more economical to sell it and buy one of the standard Constant Potential battery charging outfits on the market.

FOUR CAUSES OF GEAR CASE OIL LEAKS

Q—We have an Oakland that is throwing out oil through the timing gear case and wasting. We have taken the case off and the oil rings are good. We also put a felt washer between the case and the large timing gear, but that doesn't help any. Tell me what to do to stop it.—Brown's Garage, Smithfield, Ill.

There are four probable causes for the oil leak in the engine. No. 1 is as follows: the hole in gear case cover directly in line with the camshaft gear sometimes wears to such an extent that it is necessary to close up the hole with solder so as to make a tighter fit.

No. 2—A loose camshaft key causes oil to leak out through the clearances. Examine cam gear for looseness.

No. 3—Examine carefully the oil shedders, both on the camshaft and on the gear case. When the gear case is removed lay a straight edge across its face and make sure that the shedders are in line with the face of the case that is, touching the straight edge. Do the same thing to the shedders on the camshaft. All shedders should be in line either with the gear case or with the end of the camshaft gear.

The purpose of these shedders is to act as baffles, one to prevent the oil from throwing against the case and the other one to return it when it does strike the case. Normally they should be in their proper position but it is possible that they have been bent or deranged taking the gear case off.

No. 4—The key on the camshaft should be a very tight fit both in the gear and in the camshaft keyway as the lubrication hole comes through the end of camshaft. If the hole in the case is worn too large fill it up with solder and then scrape or ream it to a close fit around the shaft.

HIGHEST RATIO GIVES GREATEST POWER

Q—Advise which has the greatest power in a Ford car, reverse or low? Also in the average make of other cars.—Auto Mechanic.

The reverse gear has the greatest torque because it has the highest ratio. The low speed ratio of the Ford is 10 to 1 and the reverse is 14.54 to 1. In the majority of cars the reverse has a higher ratio consequently more torque and power than the low speed gear.

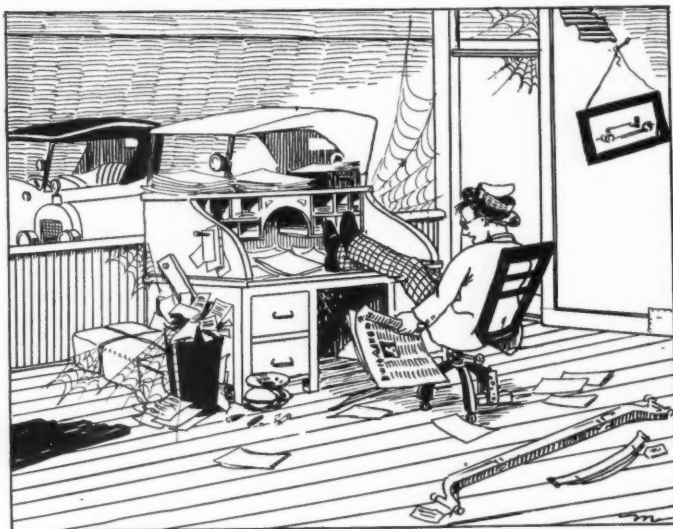
SQUEEKS & RATTLES

"YOU CAN'T MAKE A FOOL OUT OF ME" is name of popular dance and sob number in which young Romeo roars out his song of sighs at the jane who jilted him.

General public has seized spirit and is howling the same thing at some automobile dealers.

Friendly tip to other automobile dealers: let 'em sing—just see that they don't make a fool out of you.

What's Wrong Here?



Answer Somewhere Around Here

Phillip McCann

Phillip McCann was a gasoline man,
And got from his work great pleasure.
He was polite and neat, and quick on his feet,
And careful to give full measure.

With Mac was no lack of judgment and tact;
He treated all customers well.
This, he reasoned, would bring the people back
And afford new chances to sell.

"I'll not, like a chump, spend my life at the pump
To make my employer's purse fatter.
I'll start up for myself, with clean goods on the shelf,
And win out, or see what's the matter."

Friend Mac had the "guts" to refrain from price cuts:
He sold on a quality basis.
He kept out of the rut that is made by the "mut"
Who flirts with the sheriff's disgraces.

From doubt he was freed; knew right would succeed.
He sold no useless device.
Right price, he'd concede, and no thought of greed,
Would guarantee profits quite nice.

He also sold tires, to quality buyers.
His goods would never bring sorrow,
"Gyp" tires could be sold by short-sighted liars
Who were sure to be bankrupt tomorrow.

And so his store went, with all energy bent,
To keep his place above par.
Folks came without fear, from both far and near
And bought what he sold for their car.

—C. E. PACKER.

Answer to "What's Wrong Here?"

There ain't nothing wrong—this guy is happy. He isn't making any money and when he dies, no one will know it but the coroner, so what's the difference?

Now that the New York show is over and all of the cars, new and otherwise, have been announced and all of the predictions regarding a big 1924 have been so nobly uttered, we wonder if some gas saving device cannot be invented which will help conserve the supply of the precious fluid.

If there is anyone among you who would make a flock of money, let him think of a gas saver—there's a big market for such a thing.

It's funny someone didn't think of this before.

ISN'T IT FUNNY

That they make the two battery terminals
Different
So you can't get the cables on
Wrong
And the parts people then make universal
Terminals
That will fit on either
Post?

Dead Center, Ill., Yesterday.

Dear Motor Age:

It seems the rage, for cars to run folks down. They speed ten miles an hour, or more, all over this here town.

We like to talk, and gaze, and walk quite freely on the street, but when we do a car or two will knock us off our feet.

Now can't you plan some way to ban the auto from the roads, and thus relieve our feeble minds of some perplexing loads?

Of course we're just, and hope and trust the factories will close down, as that would stop the dealer's shop from thriving in our town.

This would be great. It's getting late, please don't think me a squawker. I'm nearly dead; hope you're the same.

Yours truly,

A. Jay Walker.

To Miles & Ziegfeld

(With apologies to Harris, the Broadway pioneer, who wrote the famous "After the Ball.")

After the show is over,
Withered and all forlorn
After the week is ended,
All of our pep is gone,
Many a head is aching,
Brother, it tires us so
Minding the lights on Broadway,
After the show.

N. A. C. C. Research Committee Chorus.

Paint and silver trimmings make an automobile—that's what Sam Miles has at his shows.

More paint and no trimmings make a chorus girl—that's what Flo Ziegfeld has at his shows.

There's a further difference, too, between these noted exhibitors, in that when the paint and silver trimmings wear off the automobile, some dealer has it to worry about.

But when the paint wears off a chorus girl—oh, hang the used car problem!

Breathes there a man with soul so dead
Who never to a cop has said,
When past the limit he has sped,
"Gee, why donchu pinch that guy ahead?"
HAP.



Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

| MAKE AND MODEL | Tons Capacity | Price | ENGINE | | | | REAR AXLE | | TIRES | |
|---------------------------|---------------|--------|-------------------------|---------------|-------------|--------------|--------------|-------------|----------|------|
| | | | Make & Model | Bore & Stroke | Clutch Make | Gearset Make | Make & Model | Final Drive | Front | Rear |
| Acme.....20 | 1-1 | ..... | Co-N.....3 1/2x5 | B&B | Cot. | Ti-6250. | WO. | 34x5n | 34x5n | |
| Acme.....30 | 1-1 | ..... | Co-J4.....3 1/2x5 | B&B | Cot. | Ti-6352. | WO. | 34x3 1/2 | 34x5 | |
| Acme.....40 | 1-1 | ..... | Co-J4.....3 1/2x5 | B&B | Cot. | Ti-6460. | WO. | 34x3 1/2 | 34x5 | |
| Acme.....60 | 1-1 | ..... | Co-K4.....4 1/2x5 1/2 | B&B | Cot. | Ti-6560. | WO. | 36x4 | 36x7 | |
| Acme.....90 | 1-1 | ..... | Co-L4.....4 1/2x5 1/2 | B&B | Cot. | Ti-6660. | WO. | 36x5 | 40x10 | |
| Acme.....125 | 1-1 | ..... | Co-B5.....4 1/2x6 | B&B | Cot. | Ti-6760. | WO. | 36x6 | 40x12 | |
| Amer. La France.....2 1/2 | 1-1 | \$3950 | Own.....4 1/2x6 | Own. | Own. | Own. | DR. | 36x4 | 36x7 | |
| Amer. La France.....3 1/2 | 1-1 | 4950 | Own.....4 1/2x6 | Own. | Own. | Own. | DR. | 36x5 | 36x5 | |
| Amer. La France.....5 | 1-1 | 5500 | Own.....4 1/2x6 | Own. | Own. | Own. | DR. | 36x6 | 40x6 | |
| Armleder.....21 | 1-1 | ..... | Bu-GTU.....4 1/2x5 1/2 | B-L | Ful. | Ti-6460. | WO. | 34x3 1/2 | 34x6 | |
| Armleder.....HVB | 1-1 | ..... | Bu-HTU.....4 1/2x5 1/2 | B-L | Ful. | Ti-6560. | WO. | 36x4k | 36x4dk | |
| Armleder.....HWC | 1-1 | ..... | Co-C4.....4 1/2x5 1/2 | B-L | Ful. | Ti-6560. | WO. | 36x4k | 36x4dk | |
| Armleder.....KWB | 1-1 | ..... | Bu-YTU.....4 1/2x6 | B-L | Ful. | Ti-6666. | WO. | 36x5dk | 36x5dk | |
| Armleder.....KWC | 1-1 | ..... | Co-E4.....4 1/2x5 1/2 | B-L | Ful. | Ti-6666. | WO. | 36x5dk | 36x5dk | |
| Atterbury.....20R | 1-1 | 2175 | Co-J4.....3 1/2x5 | Ful. | Ful. | Ti-6460. | WO. | 34x4k | 34x6k | |
| Atterbury.....22C | 1-1 | 3375b | Co-K4.....4 1/2x5 1/2 | B-L | Ful. | Ti-6560. | WO. | 36x4k | 36x4dk | |
| Atterbury.....22D | 1-1 | 4275b | Co-L4.....4 1/2x5 1/2 | B-L | Ful. | Ti-6660. | WO. | 36x5 | 40x6d | |
| Atterbury.....22E | 1-1 | 4975b | Co-B5.....4 1/2x6 | B-L | Ful. | Ti-6760. | WO. | 36x6 | 40x7d | |
| Autocar.....21 | 1-1 | 2200 | Own.....4 1/2x4 1/2 | Own. | Own. | Own. | DR. | 34x4 | 34x6 | |
| Autocar.....27 | 1-1 | 3450 | Own.....4 1/2x5 1/2 | Own. | Own. | Own. | DR. | 34x5 | 36x8 | |
| Autocar.....26 | 1-1 | 4650 | Own.....4 1/2x5 1/2 | Own. | Own. | Own. | DR. | 34x6 | 36x12 | |
| Available.....HJH | 1-1 | 2150 | He-O.....4x5 | B-L | B-L | Ti-6460. | WO. | 36x3 1/2 | 36x5 | |
| Available.....HJH | 1-1 | 3160 | He-O.....4x5 | B-L | B-L | Ti-6560. | WO. | 36x4 | 36x8 | |
| Available.....HJH | 1-1 | 4175 | He-MU3.....4 1/2x5 1/2 | B-L | B-L | Ti-6666. | WO. | 36x5 | 40x5d | |
| Available.....HJH | 1-1 | 5375 | He-T3.....5x6 | B-L | B-L | Ti-6760. | WO. | 36x6 | 40x12 | |
| Avery.....1-1 1/4 | 1-1 | ..... | Own.....3x4 | Own. | Own. | To-OX2 | IG. | 34x5n | 34x5n | |
| Bessemer.....G1 | 1-1 | 1450 | Co-N.....3 1/2x5 | Ful. | Ful. | To-A.....IG. | 35x5n | 35x5n | | |
| Bessemer.....H2 | 1-1 | 1995 | Co-N.....3 1/2x5 | B&B | B&B | LM-7150 | DR. | 36x3 1/2 | 36x5 | |
| Bessemer.....J2 | 1-1 | 2895 | Co-C2.....4 1/2x5 1/2 | B&B | B-L | LM-7250 | DR. | 36x4 | 36x4d | |
| Bessemer.....K2 | 1-1 | 3195 | Co-E7.....4 1/2x5 1/2 | B&B | B-L | To-E.....IG. | 36x5 | 36x10 | | |
| Bethlehem.....KN1 | 1-1 | 1385 | Own.....3 1/2x5 | B&B | Det. | Ea-1000 | SB. | 35x5n | 35x5n | |
| Bethlehem.....GN2 | 1-1 | 2185 | Own.....4 1/2x5 1/2 | B&B | Det. | Wi-60A | DR. | 34x4 | 34x6 | |
| Bethlehem.....HN3 | 1-1 | 2985 | Own.....4 1/2x5 1/2 | Ful. | Ful. | Wi-88E | DR. | 36x1 | 36x8 | |
| Brookway.....E2 | 1-1 | ..... | Wi-SU.....4x5 | B-L | B-L | Co-5200L | SB. | 33x5n | 33x5n | |
| Brookway.....S1 1/2 | 1-1 | ..... | Wi-SU.....4x5 | B-L | B-L | Ti-6460. | WO. | 36x4 | 36x6 | |
| Brookway.....K2 | 1-1 | ..... | Co-K4.....4 1/2x5 1/2 | B-L | B-L | Ti-6560. | WO. | 36x1 | 36x8 | |
| Brookway.....R3 | 1-1 | ..... | Co-L4.....4 1/2x5 1/2 | B-L | B-L | Ti-6666. | WO. | 36x5 | 36x5d | |
| Brookway.....T5 | 1-1 | ..... | Co-B5.....4 1/2x6 | B-L | B-L | Ti-6760. | WO. | 36x6 | 40x7d | |
| Buick.....23-4-SD | 3/4 | 945 | Own.....3 1/2x4 1/2 | Own. | Own. | SB. | 31x4n | 31x4n | | |
| Case.....TR2 | 1-1 | ..... | Own.....4 1/2x5 1/2 | TD. | Own. | To-C139 | IG. | 36x6n | 38x7n | |
| Chevrolet.....Sup | 1-1 | 395 | Own.....3 1/2x4 | Own. | Own. | Own. | SB. | 30x3 1/2 | 30x3 1/2 | |
| Chevrolet.....J2 | 1-1 | 550 | Own.....3 1/2x4 | Own. | Own. | Own. | SB. | 31x4n | 34x4 1/2 | |
| Cinton.....20 | 1-1 | 1980 | Bu-WTU.....3 1/2x5 1/2 | B-L | B-L | Ti-6250. | WO. | 34x5n | 34x5n | |
| Cinton.....45 | 1-1 | 2840 | Bu-GTU.....4 1/2x5 1/2 | B-L | B-L | Ti-6460. | WO. | 34x4 | 34x3 1/2 | |
| Cinton.....65 | 1-1 | 3180 | Bu-ETU.....4 1/2x5 1/2 | B-L | B-L | Ti-6560. | WO. | 34x5 | 34x5d | |
| Cinton.....90 | 1-1 | 4160 | Bu-YTU.....4 1/2x6 | B-L | B-L | Ti-6666. | WO. | 36x6 | 36x6d | |
| Cinton.....120 | 1-1 | 4890 | Bu-BTU.....5 1/2x6 1/2 | B-L | B-L | Ti-6760. | WO. | 36x6 | 36x7d | |
| Clydesdale.....10A | 1-1 | 1785 | Co-N.....3 1/2x5 | B&B | B-L | Ti-6250 | SB. | 34x5n | 34x5n | |
| Clydesdale.....8 1/2 | 1-1 | 2650 | Co-K4.....4 1/2x5 1/2 | B-L | B-L | Ti-6460. | WO. | 36x4 | 36x7 | |
| Clydesdale.....6 3/4 | 1-1 | 3300 | Co-L4.....4 1/2x5 1/2 | B-L | B-L | Ti-6560. | WO. | 36x5 | 36x5d | |
| Clydesdale.....4 1/2 | 1-1 | 4200 | Co-B5.....4 1/2x6 | B-L | B-L | Ti-6666. | WO. | 36x6 | 40x6d | |
| Clydesdale.....2 1/2 | 1-1 | 4500 | Co-B5.....4 1/2x6 | B-L | B-L | Ti-6760. | WO. | 36x7 | 40x7d | |
| Commerce.....9 1/2-1 1/4 | 1-1 | ..... | Co-N.....3 1/2x5 | Det. | Det. | Sa-D16 | SB. | 33x5n | 33x5n | |
| Commerce.....14 1/2 | 1-1 | ..... | Co-J4.....3 1/2x5 | B-L | B-L | Ti-6560. | WO. | 36x3 1/2 | 36x5k | |
| Commerce.....25 1/2 | 1-1 | ..... | Co-K4.....4 1/2x5 1/2 | B-L | B-L | Ti-6660. | WO. | 36x4 | 36x7k | |
| Corbett.....S1 3/4 | 1-1 | ..... | HS-30.....3 1/2x5 | B-L | B-L | Sh-1002. | WO. | 34x4 1/2 | 34x4 1/2 | |
| Corbett.....E1 | 1-1 | ..... | Co-N.....3 1/2x5 | B-L | B-L | Sh-1002 | WO. | 34x3 1/2 | 34x4k | |
| Corbett.....D1 1/2 | 1-1 | ..... | Co-J4.....3 1/2x5 | B-L | B-L | Sh-1501. | WO. | 34x3 1/2 | 34x5k | |
| Corbett.....C2 | 1-1 | ..... | Co-K4.....4 1/2x5 1/2 | B-L | B-L | Sh-103. | WO. | 36x3 1/2 | 36x7k | |
| Corbett.....B2 1/2 | 1-1 | ..... | Co-K4.....4 1/2x5 1/2 | B-L | B-L | Sh-21. | WO. | 36x4 | 36x8 | |
| Corbett.....R3 | 1-1 | ..... | Co-L4.....4 1/2x5 1/2 | B-L | B-L | Sh-21. | WO. | 36x5 | 36x10 | |
| Corbett.....AA 1/2 | 1-1 | ..... | Co-L4.....4 1/2x5 1/2 | B-L | B-L | Sh-51. | WO. | 36x6 | 40x12 | |
| Corbett.....AA 5 | 1-1 | ..... | Co-B5.....4 1/2x6 | Del. | B-L | Sh-51. | WO. | 36x6 | 40x12 | |
| Day-Elder.....AN 1 1/2 | 1-1 | ..... | Bu-WTU.....3 1/2x5 1/2 | B-L | B-L | Ti-6352. | WO. | 34x3 1/2 | 34x4 | |
| Day-Elder.....BN 2 1/2 | 1-1 | ..... | Co-J4.....3 1/2x5 | B-L | B-L | Ti-6460. | WO. | 34x3 1/2 | 34x5 | |
| Day-Elder.....DN 2 1/2 | 1-1 | ..... | Co-K4.....4 1/2x5 1/2 | B-L | B-L | Ti-6560. | WO. | 36x4 | 36x7 | |
| Day-Elder.....CN 3 | 1-1 | ..... | Co-L4.....4 1/2x5 1/2 | B-L | B-L | Ti-6660. | WO. | 36x5 | 36x5d | |
| Day-Elder.....FN 1 | 1-1 | ..... | Bu-HTU.....4 1/2x5 1/2 | B-L | B-L | Ti-6560. | WO. | 36x4 | 36x8 | |
| Day-Elder.....EN 5-6 | 1-1 | ..... | Co-L4.....4 1/2x5 1/2 | B-L | B-L | Ti-6666. | WO. | 36x5 | 36x5d | |
| Dearborn.....E1 | 1-1 | 1600 | Bu-YTU.....4 1/2x6 | B-L | B-L | Ti-6760. | WO. | 36x5 | 40x6d | |
| Dearborn.....F1 1/2 | 1-1 | 1980 | Bu-Mu.....3 1/2x5 1/2 | Ful. | Ful. | Wi.....WO. | 35x5n | 35x5n | | |
| Dearborn.....48 2 | 1-1 | 2390 | Bu-WU.....3 1/2x5 1/2 | Ful. | Ful. | Wi.....WO. | 34x4 1/2 | 34x5 | | |
| Denby.....31 1/2-1 1/4 | 1-1 | 1485 | Co-N.....3 1/2x5 | Ful. | Ful. | Cl-B300* | SB. | 34x5n | 34x5n | |
| Denby.....33 2 | 1-1 | 2375 | Co-J4.....3 1/2x5 | Ful. | Ful. | Cl-D1D. | IG. | 35x5n | 38x7n | |
| Denby.....35 3 | 1-1 | 2975 | Co-K4.....4 1/2x5 1/2 | Ful. | Ful. | Cl-D2D. | IG. | 36x4 | 36x8 | |
| Denby.....27 1 | 1-1 | 3695 | Co-L4.....4 1/2x5 1/2 | Ful. | Ful. | Cl-D3D. | IG. | 36x5 | 36x5d | |
| Denby.....210 5 | 1-1 | 4295 | Co-B5.....4 1/2x6 | Ful. | Ful. | Cl-D5D. | IG. | 36x6 | 40x6d | |
| Denby.....214 7 | 1-1 | 4945 | Co-B5.....4 1/2x6 | Ful. | Ful. | Ru.....IG. | 36x6 | 40x14 | | |
| Dependable.....CD 1 1/2-2 | 1-1 | 2350 | Bu-CTU.....3 1/2x5 1/2 | Ful. | Ful. | Wi-900J | WO. | 34x5 | 34x8 | |
| Dependable.....EG 2 1/2-3 | 1-1 | 2950 | Bu-ETU.....4 1/2x5 1/2 | Ful. | Ful. | Wi-900C | WO. | 36x5 | 36x10 | |
| Diamond T.....75 1-1 1/4 | 1-1 | ..... | He-O.....4x5 | Cov. | Cov. | Co-52021 | SB. | 33x5n | 33x5n | |
| Diamond T.....03 1-1 1/4 | 1-1 | ..... | Hi-700.....3 1/2x5 1/2 | Cov. | Cov. | Own.....WO. | 36x3 1/2 | 36x4 | | |
| Diamond T.....T1 1 1/4 | 1-1 | ..... | Hi-700.....3 1/2x5 1/2 | Cov. | Cov. | Ti-6460. | WO. | 36x3 1/2 | 36x5 | |
| Diamond T.....U2 2 1/2 | 1-1 | ..... | Hi-1400.....4 1/2x5 1/2 | Cov. | Cov. | Ti-6560. | WO. | 36x4k | 36x8k | |
| Diamond T.....K3 3 1/2 | 1-1 | ..... | Hi-1500.....4 1/2x5 1/2 | Cov. | Cov. | Ti-6666. | WO. | 36x5 | 36x5d | |
| Diamond T.....EL 5 | 1-1 | ..... | Hi-200.....4 1/2x5 1/2 | Cov. | Cov. | Ti-6760. | WO. | 36x6 | 40x6d | |
| Diamond T.....S5 | 1-1 | ..... | Hi-B2.....4 1/2x6 | B-L | B-L | Ti-6760. | WO. | 36x6 | 40x6d | |
| Dodge Brothers.....3/4 | 1-1 | 730 | Own.....3 1/2x4 1/2 | Own. | Own. | Own.....SB. | 32x4n | 32x4n | | |
| Dorris.....K2 | 1-1 | \$2490 | Own.....4 1/2x5 1/2 | Own. | War. | Ti-5512. | IG. | 33x5n | 33x5n | |
| Dorris.....K4 2 1/2 | 1-1 | 3400 | Own.....4 1/2x5 1/2 | Own. | War. | Ti-5560. | WO. | 36x4 | 36x7 | |
| Dorris.....K7 3 1/2 | 1-1 | 4400 | Own.....4 1/2x5 1/2 | Own. | War. | Ti-6660. | WO. | 36x7 | 36x10 | |
| Dort.....109 | 1-1 | 685b | Ly-K.....3 1/2x5 | Del. | Own. | Fi-105. | SB. | 31x4n | 31x4n | |
| Duplex.....C1 | 1-1 | ..... | Bu-WTU.....3 1/2x5 1/2 | B-L | B-L | Ti-5511. | SB. | 33x5 | 33x5n | |
| Duplex.....GH 1 1/2 | 1-1 | ..... | Bu-WTU.....3 1/2x5 1/2 | Cov. | Cov. | Sh-1591. | WO. | 35x5 | 36x6 | |
| Duplex.....A2 | 1-1 | ..... | Hi-400.....4 1/2x5 1/2 | Cov. | Cov. | Sh-103. | WO. | 35x5n | 38x7n | |
| Duplex.....AC 2 1/2-3 | 1-1 | ..... | Hi-400.....4 1/2x5 1/2 | B-L | B-L | Vu-4. | WO. | 34x5 | 36x8 | |
| Duplex.....E3 1/2 | 1-1 | ..... | Bu.....4 1/2x5 1/2 | B-L | B-L | Own.....IG. | 36x8 | 36x8 | | |
| F.W.D.....B3 | 1-1 | 4200 | Wi-A.....4 1/2x5 1/2 | H-S. | Cot. | Own.....SP. | 36x4 | 36x6 | | |
| Fageol.....1 1/2 | 1-1 | 3000 | Wa-YA.....3 1/2x5 1/2 | B-L | Own. | Ti-6461. | WO. | 34x3 1/2 | 34x6 | |
| Fageol.....2 1/2 | | | | | | | | | | |

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

| MAKE AND MODEL | Tons Capacity | ENGINE | | | | | REAR AXLE | | TIRES | | MAKE AND MODEL | Tons Capacity | ENGINE | | | | | REAR AXLE | | TIRES | |
|------------------|---------------|--------|--------------|---------------|-------------|--------------|--------------|-------------|----------|----------|----------------|---------------|--------|---------------|---------------|-------------|--------------|--------------|-------------|----------|----------|
| | | Price | Make & Model | Bore & Stroke | Clutch Make | Gearset Make | Make & Model | Final Drive | Front | Rear | | | Price | Make & Model | Bore & Stroke | Clutch Make | Gearset Make | Make & Model | Final Drive | Front | Rear |
| Kinsel | 4 | \$3625 | Own | 4 1/2 x 5 1/2 | War. | War. | Sh-31 | WO. | 36x5 | 36x12 | Schacht | 5 | \$4600 | Wi-VAU | 4 1/2 x 6 | B&B. | Own | Own | WO. | 36x5 | 40x7 1/2 |
| Larrabee | X2 | 1785 | Co-RL | 3 3/4 x 4 1/2 | B-L | B-L | Sa-1480 | SB. | 34x5n | 34x5n | Selden | 30C | 2375 | Co-J4 | 3 3/4 x 5 | B-L | B-L | TI | WO. | 34x3 1/2 | 34x5k |
| Larrabee | J4 | 2100 | Co-J4 | 3 3/4 x 5 | B-L | B-L | Sh-1501 | WO. | 34x3 1/2 | 34x5k | Selden | 50B | 3250 | Co-K4 | 4 1/2 x 5 1/2 | B-L | B-L | TI | WO. | 36x4k | 36x7k |
| Larrabee | K5 | 2310 | Co-L4 | 4 1/2 x 5 1/2 | B-L | B-L | Sh-22 | WO. | 36x4 | 36x8 | Selden | 53B | 3550 | Co-L4 | 4 1/2 x 5 1/2 | B-L | B-L | TI | WO. | 36x4k | 36x7k |
| Larrabee | L4 | 4100 | Co-L4 | 4 1/2 x 5 1/2 | B-L | B-L | Sh-31 | WO. | 36x5 | 36x10 | Selden | 70B | 4175 | Co-L4 | 4 1/2 x 5 1/2 | B-L | B-L | TI | WO. | 36x5k | 36x10k |
| Maccar | EX | 11 1/2 | Wi-SU | 4x5 | B-L | B-L | Sa-1526e | SB. | 34x5n | 34x5n | Selden | 73 1/2 | 4475 | Co-B5 | 4 1/2 x 6 | B-L | B-L | TI | WO. | 36x5k | 36x10k |
| Maccar | L-1 | 11 1/2 | Wi-TAU | 4x6 | B-L | B-L | Ti-6460 | WO. | 36x4 | 36x6 | Selden | 90A5 | 4950 | Co-B5 | 4 1/2 x 6 | Del. | TI | WO. | 36x6k | 36x12 | |
| Maccar | HT2 | 11 1/2 | Wi-TAU | 4x6 | B-L | B-L | Ti-6560 | WO. | 36x4 | 36x4d | Service | 25 | 11 1/2 | Bu-WTU | 3 3/4 x 5 1/2 | B-L | B-L | Ea-1000 | SB. | 34x5n | 34x5n |
| Maccar | H-13 | 11 1/2 | Wi-TAU | 4x6 | B-L | B-L | Ti-6560 | WO. | 36x4 | 36x5d | Service | 33 | 11 1/2 | Bu-GBU | 4 1/2 x 5 1/2 | B&B. | B-L | Ti-6352 | WO. | 34x3 1/2 | 34x6 |
| Maccar | M-24 | 11 1/2 | Wi-VAU | 4x6 | B-L | B-L | Ti-6666 | WO. | 36x5 | 36x6d | Service | 42 | 11 1/2 | Bu-FBU | 4 1/2 x 5 1/2 | B&B. | B-L | Ti-6460 | WO. | 36x4 | 36x7 |
| Maccar | G-15 | 11 1/2 | Wi-RBU | 5x6 | B-L | B-L | Ti-6760 | WO. | 36x6 | 40x6d | Service | 61 | 11 1/2 | Bu-YBU | 4 1/2 x 5 1/2 | B&B. | B-L | Ti-6560 | WO. | 36x4 | 36x8 |
| MacDonald | O-35 | 5500b | Bu-WTU | 3 3/4 x 5 1/2 | B-L | B-L | **Own | IG. | 36x6 | 36x10 | Service | 81 | 11 1/2 | Bu-YBU | 4 1/2 x 6 | B&B. | B-L | Ti-6666 | WO. | 36x5 | 36x10 |
| MacDonald | A-7 | 8003b | Bu-YTU | 4 1/2 x 6 | B-L | B-L | **Own | IG. | 40x7 | 40x14 | Service | 103 1/2 | 11 1/2 | Bu-YBU | 4 1/2 x 6 | B&B. | B-L | Ti-6760 | WO. | 36x6 | 40x12 |
| Mack | AB | 3000 | Own | 4x5 | Own | Own | Own | Ch. | 36x4 | 36x3 1/2 | Signal | NF | 11 1/2 | Co-J4 | 3 3/4 x 5 | B-L | B-L | Ti-6352 | WO. | 34x5n | 36x6n |
| Mack | AB | 3150 | Own | 4x5 | Own | Own | Own | DR. | 36x4 | 36x3 1/2 | Signal | H2 | 11 1/2 | Co-K4 | 4 1/2 x 5 1/2 | B-L | B-L | Ti-6460 | WO. | 34x4 | 36x6 |
| Mack | AB2 | 3300 | Own | 4 1/2 x 5 | Own | Own | Own | Ch. | 36x4 | 36x4d | Signal | NF | 11 1/2 | Co-K4 | 4 1/2 x 5 1/2 | B-L | B-L | Ti-6560 | WO. | 34x4 | 36x8 |
| Mack | AB2 | 3750 | Own | 4 1/2 x 5 | Own | Own | Own | DR. | 36x4 | 36x4d | Signal | M5 | 11 1/2 | Co-L4 | 4 1/2 x 5 1/2 | B-L | B-L | Ti-6666 | WO. | 36x5 | 40x10 |
| Mack | AB2 | 3400 | Own | 4 1/2 x 5 | Own | Own | Own | Ch. | 36x4 | 36x4d | Signal | R7 | 11 1/2 | Co-B5 | 4 1/2 x 6 | B-L | B-L | Ti-6760 | WO. | 36x6 | 40x12 |
| Mack | AB2 | 3850 | Own | 4 1/2 x 5 | Own | Own | Own | DR. | 36x4 | 36x4d | Standard | 75 | 13301 | Co-N | 3 3/4 x 5 | B-L | B-L | Ti-6250 | WO. | 33x5n | 33x5n |
| Mack | AC3 | 4950 | Own | 5x6 | Own | Own | Own | Ch. | 36x5 | 40x5d | Standard | 1 1/2 | 1695 | Co-N | 3 3/4 x 5 | B-L | B-L | Ti-6352 | WO. | 34x3 1/2 | 34x5 |
| Mack | AC3 | 5500 | Own | 5x6 | Own | Own | Own | Ch. | 36x6 | 40x6d | Standard | 2 1/2 | 2795 | Co-K4 | 4 1/2 x 5 1/2 | B-L | B-L | Ti-6560 | WO. | 36x4 | 36x8 |
| Mack | AC6 1/2 | 5750 | Own | 5x6 | Own | Own | Own | Ch. | 36x6 | 40x12 | Standard | 3 1/2 | 3615 | Co-L4 | 4 1/2 x 5 1/2 | B-L | B-L | Ti-6666 | WO. | 36x5 | 36x12 |
| Mack | AC7 1/2 | 6000 | Own | 5x6 | Own | Own | Own | Ch. | 36x7 | 40x7d | Standard | 5K5 | 4495 | Co-B5 | 4 1/2 x 6 | B-L | B-L | Ti-6760 | WO. | 36x6 | 40x14 |
| Mack | AB5 | 3400 | Own | 4 1/2 x 5 | Own | Own | Own | Ch. | 36x4 | 36x4d | Star | 1 1/2 | 405 | Co-Spec. | 3 3/4 x 4 1/2 | Own | War | Ti-Spec. | SB. | 30x3 1/2 | 30x3 1/2 |
| Mack | AC7 | 4950 | Own | 5x6 | Own | Own | Own | Ch. | 36x5 | 40x5d | Sterling | 1 1/2 | 3240 | Wa-FU | 4x5 1/2 | B-L | B-L | Ti-6460 | WO. | 36x3 1/2 | 36x5k |
| Mack | AC10 | 5500 | Own | 5x6 | Own | Own | Own | Ch. | 36x6 | 40x6d | Sterling | 1 1/2 | 3440 | Wa-FU | 4x5 1/2 | B-L | B-L | Ti-6560 | WO. | 36x4k | 36x6k |
| Mack | AC13 | 5750 | Own | 5x6 | Own | Own | Own | Ch. | 36x6 | 40x12 | Sterling | 1 1/2 | 3700 | Wa-CU | 4x5 1/2 | B-L | B-L | Ti-6560 | WO. | 36x4k | 36x6k |
| Mack | AC15 | 6000 | Own | 5x6 | Own | Own | Own | Ch. | 36x7 | 40x7d | Sterling | 1 1/2 | 4750 | Wa-DU | 4x6 1/2 | H-S | Own | Ti-6666 | WO. | 36x5 | 40x6d |
| Mason | 11 1/2 | 1295 | He. | 4x5 | Hoo. | War | FL | SB. | 34x5n | 34x5n | Sterling | 5 | 5100 | Wa-EU | 5x6 1/2 | H-S | Own | Ti-6760 | WO. | 36x6 | 40x6d |
| Master | 21 | 11 1/2 | Bu-WTU | 3 3/4 x 5 1/2 | Ful. | Ful. | Ti-5511 | SB. | 33x5n | 33x5n | Sterling | EHD5 | 6090 | Wa-EU | 5x6 1/2 | H-S | Own | Own | Ch. | 36x6 | 40x7d |
| Master | 21 1/2 | 11 1/2 | Bu-OU | 4 1/2 x 5 1/2 | Ful. | Ful. | Ti-6160 | WO. | 34x4 | 34x6 | Sterling | EHD7 1/2 | 6500 | Wa-EU | 5x6 1/2 | H-S | Own | Own | Ch. | 36x6 | 40x7d |
| Master | 41 1/2 | 11 1/2 | Bu-ETU | 4 1/2 x 5 1/2 | Ful. | Ful. | Ti-6560 | WO. | 34x4 | 36x8 | Stewart | 16 | 1095 | Ly-CT | 3 3/4 x 5 | Ful. | CL-AW | IG. | 34x4 1/2 | 34x4 1/2 | |
| Master | 51 1/2 | 11 1/2 | Bu-YTU | 4 1/2 x 6 | B-L | B-L | Ti-6666 | WO. | 36x5 | 40x10 | Stewart | 15-X | 1195 | Bu-MU | 3 3/4 x 5 | Ful. | CL-1D | IG. | 34x3 1/2 | 34x3 1/2 | |
| Master | 61 1/2 | 11 1/2 | Bu-YTU | 4 1/2 x 6 | B-L | B-L | Ti-6760 | WO. | 36x5 | 40x12 | Stewart | 9 | 1870 | Co-N | 3 3/4 x 5 | Ful. | CL-1D | IG. | 34x4k | 36x12 | |
| Master | 64 1/2 | 11 1/2 | Bu-ATU | 4 1/2 x 6 1/2 | B-L | B-L | Ti-6760 | WO. | 36x6 | 40x14 | Stewart | 7K | 2590 | Bu-HTU | 4 1/2 x 5 1/2 | Ful. | CL-1D | IG. | 34x4k | 36x12 | |
| Maxwell | 1 1/2 | 1097 | Own | 3 3/4 x 4 1/2 | Own | Own | TI | WO. | 35x5n | 35x5n | Stewart | 10X | 3110 | Bu-HTU | 4 1/2 x 5 1/2 | Ful. | CL-1D | IG. | 34x4k | 36x12 | |
| Menominee | B | 1050 | Wi-SU | 4x5 | B&B. | Det. | Co-5200 | SB. | 35x5n | 35x5n | Stoughton | AS | 1185 | MI-H10 | 3 3/4 x 4 1/2 | Del. | Can. | Co-5200 | SB. | 34x4 1/2 | 34x4 1/2 |
| Menominee | HT | 2000 | Wi-CAU | 3 3/4 x 5 | Ful. | Del. | Wi-800G | WO. | 34x3 1/2 | 36x5k | Stoughton | AS | 200 | Wa-BUX | 3 3/4 x 5 1/2 | B-L | B-L | Co-5200 | SB. | 34x5n | 36x5k |
| Menominee | H | 2175 | Wi-EAU | 4x5 | Ful. | Del. | Wi-800H | WO. | 36x3 1/2 | 36x5k | Stoughton | B | 2150 | Wa-BUX | 3 3/4 x 5 1/2 | B-L | B-L | Sh-1501 | WO. | 36x4 | 36x7 |
| Menominee | D | 2875 | Wi-TAU | 4x6 | Ful. | Del. | Wi-800J | WO. | 36x4 | 36x8 | Stoughton | D | 2190 | He-CU3 | 4x5 1/2 | B-L | B-L | Sh-103 | WO. | 36x5 | 36x5d |
| Menominee | J | 4850 | Wi-RAU | 4x6 | B&B. | Det. | Ti-6760 | WO. | 36x6 | 40x12 | Stoughton | F | 3150 | MI-402 | 4 1/2 x 5 1/2 | B-L | B-L | Sh-21 | WO. | 36x5 | 36x5n |
| Moline | 10 1/2 | 1695 | Own | 3 3/4 x 5 | B&B. | Own | To-A | IG. | 34x5n | 36x6n | Thomart | 20 | 1795 | HI-400 | 4x5 1/2 | War | War | Ea-1000 | SB. | 34x5n | 36x5 |
| Nash | 2018 | 1595 | Own | 3 3/4 x 5 | B&B. | Det. | CL-1D | IG. | 34x4 | 34x5 | Tiffin | GW | 2100 | Co-C1 | 4 1/2 x 5 1/2 | Ful. | Ful | Sh-103 | WO. | 36x3 1/2 | 36x5 |
| Nash | 4017F | 2750 | Bu-HU | 4 1/2 x 5 1/2 | B&B. | Own | Own | IG. | 36x6 | 36x6 | Tiffin | MW | 2100 | Co-C4 | 4 1/2 x 5 1/2 | Ful. | Ful | Sh-21 | WO. | 36x4 | 40x5d |
| Nash | 3018 | 2150 | Own | 3 3/4 x 5 | B&B. | Det. | CL-2D | IG. | 34x4 | 34x7 | Tiffin | F35 | 3600 | Co-L4 | 4 1/2 x 5 1/2 | Del. | Cot | Sh-31 | WO. | 36x5 | 40x5d |
| Nash | 5018 | 2250 | Own | 3 3/4 x 5 | B&B. | Det. | CL-2D | IG. | 34x4 | 34x7 | Tiffin | TW | 4300 | Co-B2 | 4 1/2 x 6 | B&B. | Cot | Sh-51 | WO. | 36x6 | 40x1 |
| Noble | A-75 | 1395 | Bu-WTU | 3 3/4 x 5 1/2 | Ful. | Ful. | CL-300 | SB. | 34x4 1/2 | 34x4 1/2 | Tiffin | UW | 4500 | Co-B2 | 4 1/2 x 6 | B&B. | Cot | Sh-51 | WO. | 36x6 | 40x1 |
| Noble | A-21 | 1899 | Bu-WTU | 3 3/4 x 5 1/2 | Ful. | Ful. | Sh-1501 | WO. | 34x5 | 34x5 | Titan | 2 1/2 | 2700 | Bu-HTU | 4 1/2 x 5 1/2 | B&B. | Cot | Own | DR | 36x4 | 40x10 |
| Noble | B-31 | 2695 | Bu-CTU | 3 3/4 x 5 1/2 | Ful. | Ful. | Sh-103 | WO. | 36x4 | 36x7 | Titan | 3 1/2 | 3600 | Bu-YTU | 4 1/2 x 5 1/2 | B&B. | Cot | Own | DR | 36x5 | 40x12 |
| Noble | D-51 | 3150 | Bu-ETU | 4 1/2 x 5 1/2 | Ful. | Ful. | Sh-21 | WO. | 36x4 | 36x8 | Titan | 5 | 4195 | Co-N | 3 3/4 x 5 | Cov. | Cov. | RU | IG. | 35x5n | 35x5n |
| Noble | E-71 | 3850 | Bu-YTU | 4 1/2 x 6 | Ful. | War | Sh-30 | WO. | 36x5 | 36x10 | Traffic | 1 1/2 | 1800 | Co-N | 3 3/4 x 5 | Cov. | Cov. | RU | IG. | 35x5n | 35x5n |
| Old Reliable | B | 3500 | Wi-UAU | 4x6 | Ful. | Ful. | Sh-21 | WO. | 34x4 | 36x8 | Traffic | 2 | 1695 | Co-N | 3 3/4 x 5 | Cov. | Cov. | RU | IG. | 34x3 1/2 | 34x5 |
| Old Reliable | C | 4250 | Wi-VAU | 4x6 | Ful. | Ful. | Sh-31 | WO. | 36x5 | 36x12 | Traffic | 3 | 2145 | Co-N | 3 3/4 x 5 | Cov. | Cov. | RU | IG. | 36x4 | 36x7 |
| Old Reliable | D | 5000 | Wi-RAU | 4x6 | Own | B-L | Sh-51 | WO. | 36x6 | 40x12 | Transport | 15 1/2 | 15 | Co-N | 3 3/4 x 5 | Ful. | Ful | Co-51023 | SB. | 32x4 1/2 | 32x4 1/2 |
| Old Reliable | K | 6000 | Wa-P | 4 1/2 x 6 1/2 | Own | Own | Own | Ch. | 36x6 | 40x14 | Transport | 26 1/2 | 26 1/2 | Bu-WTU | 3 3/4 x 5 1/2 | Ful. | Ful | CL-1D | IG. | 36x3 1/2 | 36x5 |
| Oldsmobile | T | 1095 | Own | 3 3/4 x 5 | B&B. | War | To-OXZ | IG. | 35x5n | 35x5n | Transport | 36 1/2 | 36 1/2 | Bu-GTU | 4 1/2 x 5 1/2 | Ful. | Ful | CL-1D | IG. | 36x4 | 36x8 |
| Oneida | B | 1825 | Hi-400 | 4x5 1/2 | Ful. | Ful. | Wi-800J | WO. | 36x3 1/2 | 36x7 | Transport | 55 1/2 | 55 1/2 | Co-C2 | 4 1/2 x 5 1/2 | Ful. | Ful | CL-2D | IG. | 36x4 | 36x8 |
| Oneida | C | 3200 | Hi-400 | 4x5 1/2 | Ful. | Ful. | Wi-900C | WO. | 36x4 | 36x7 | Transport | 61 1/2 | 61 1/2 | Bu-ETU | 4 1/2 x 5 1/2 | Ful. | Ful | CL-2F | IG. | 36x5 | 36x12 |
| Oneida | D | 4050 | Hi-200 | 4x5 1/2 | Ful. | Ful. | Ti-6652 | WO. | 36x5 | 36x10 | Transport | 75 1/2 | 75 1/2 | Bu-ETU | 4 1/2 x 6 | B&B. | Cot | CL-3D | IG. | 36x5 | 36x12 |
| Overland | 91ce | 395 | Own | 3 3/4 x 4 | B&B. | Own | SB. | 30x3 1/2 | 30x3 1/2 | Traylor | B | 11 1/2 | Bu-WU | 3 3/4 x 5 1/2 | Cov. | Cov. | Sh-1501 | WO. | 36x4 | 36x7 | |
| Patriot, Revere | 1 | 1350 | Co-N | 3 3/4 x 5 | B&B. | Cov. | Ti-6250 | WO. | 35x5n | 35x5n | Traylor | C | 2850 | Bu-ETU | 4 1/2 x 5 1/2 | Cov. | Cov. | Sh-103 | WO. | 36x4 | 36x8 |
| Patriot, Lincoln | 2 | 2400 | Hi-400 | 4x5 1/2 | Cov. | Ful | Ti-6560 | WO. | 34x4k | 34x4k | Traylor | D | 3300 | Bu-HTU | 4 1/2 x 5 1/2 | Own | Own | Sh-21 | WO. | 36x6 | 40x6d |
| Pat., Washington | 3 | 3000 | Hi-200 | 4x5 1/2 | Cov. | Cov. | Wi-900 | WO. | 36x5k | 36x8k | Traylor | F | 4700 | Bu-YTU | 4 1/2 x 6 | B-L | B-L | Sh-32 | WO. | 36x4 | 36x8 |
| Pierce Arrow XA | 2 | 3300 | Own | 4x5 1/2 | Own | Own | Own | WO. | 36x4 | 36x5d | Triangle | AA | 1285 | HS-7000 | 3 3/4 x 5 | Ful. | Ful | CL-1360 | SB. | 34x4 1/2 | 34x4 1/2 |
| Pierce Arrow XB | 3 | 3500 | Own | 4x5 1/2 | Own | Own | Own | WO. | 36x5 | 36x5d | Triangle | A | 1985 | Wa-BUX | 3 3/4 x 5 1/2 | Ful. | Ful | CL-1D | | | |

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

CANADIAN

| MAKE AND MODEL | Tons Capacity | Price | ENGINE | | Clutch Make | Gearset Make | REAR AXLE | | TIRES | | MAKE AND MODEL | Tons Capacity | Price | ENGINE | | Clutch Make | Gearset Make | REAR AXLE | | TIRES | |
|--------------------|---------------|--------|--------------|---------------|-------------|--------------|--------------|-------------|-------|-------|----------------|---------------|--------|--------------|---------------|-------------|--------------|--------------|-------------|-------|-------|
| | | | Make & Model | Bore & Stroke | | | Make & Model | Final Drive | Front | Rear | | | | Make & Model | Bore & Stroke | | | Make & Model | Final Drive | Front | Rear |
| Gottfredson... 20 | 14-1 | \$2275 | Bu-WTU | 3 1/2 x 5 1/2 | B-L. | B-L. | Ti-6250. | W.O. | 34x5n | 34x5n | National... FA | 1 | \$2450 | Wa-BUX | 3 1/2 x 5 1/2 | B-L. | B-L. | Ti-6352. | W.O. | 35x5n | 35x5n |
| Gottfredson... 49 | 14-1 | 3290 | Bu-GTU | 4 1/2 x 5 1/2 | B-L. | B-L. | Ti-6400. | W.O. | 36x6n | 38x7n | National... GA | 1 | 2750 | Wa-BUX | 3 1/2 x 5 1/2 | B-L. | B-L. | Ti-6460. | W.O. | 34x4k | 34x6k |
| Gottfredson... 59 | 14-1 | 3775 | Bu-EtU | 4 1/2 x 5 1/2 | B-L. | B-L. | Ti-6500. | W.O. | 36x4 | 36x8 | National... HD | 1 | 3750 | Wa-CU | 4 1/2 x 5 1/2 | H-S. | B-L. | Ti-6500. | W.O. | 36x5 | 36x10 |
| Gottfredson... 89 | 14-1 | 4775 | Bu-YTU | 4 1/2 x 6 | B-L. | B-L. | Ti-6600. | W.O. | 34x5 | 36x12 | National... NB | 1 | 4750 | Wa-DU | 4 1/2 x 5 1/2 | H-S. | B-L. | Ti-6600. | W.O. | 36x6 | 36x12 |
| Gottfredson... 100 | 14-1 | 5800 | Bu-BTU | 5 1/2 x 6 1/2 | B-L. | B-L. | Ti-6700. | W.O. | 36x6 | 40x14 | National... OA | 1 | 6150 | Wa-EU | 5 1/2 x 6 1/2 | H-S. | B-L. | Ti-6700. | W.O. | 36x6 | 40x14 |
| Mapleleaf... 116 | 14-1 | 3000 | Hi-300. | 3 1/2 x 5 1/2 | Ful. | Ful. | Sh-1501. | W.O. | 34x5n | 36x6n | Veteran... M | 1 | 2699 | Bu-CTU | 3 1/2 x 5 1/2 | B&B. | Cot. | Sh-1501. | W.O. | 34x5n | 34x5n |
| Mapleleaf... AA | 14-1 | 3600 | Hi-400. | 4 1/2 x 5 1/2 | Ful. | Ful. | Sh-103. | W.O. | 36x4 | 36x7 | Veteran... P | 1 | 3099 | Bu-HTU | 4 1/2 x 5 1/2 | B&B. | Cot. | Sh-103. | W.O. | 36x4 | 36x7 |
| Mapleleaf... BB | 14-1 | 4050 | Hi-500. | 4 1/2 x 5 1/2 | Ful. | Ful. | Sh-21. | W.O. | 36x4 | 36x7 | Veteran... R | 1 | 4200 | Bu-HTU | 4 1/2 x 5 1/2 | B&B. | Cot. | Sh-21. | W.O. | 36x4 | 36x7 |
| Mapleleaf... CC | 14-1 | 4800 | Hi-200. | 4 1/2 x 5 1/2 | Ful. | Ful. | Sh-31. | W.O. | 36x5 | 36x5d | Veteran... S | 1 | 5395 | Bu-YTU | 4 1/2 x 6 | B&B. | Cot. | Sh-31. | W.O. | 36x5 | 36x10 |
| Mapleleaf... DD | 14-1 | 5925 | Hi-1600. | 4 1/2 x 5 1/2 | Ful. | Ful. | Sh-51. | W.O. | 36x6 | 36x6d | | | | | | | | | | | |

Current Tractor Specifications

| MAKE & MODEL | Drawbar-Pulley Rating | Recommended No. of 14 Ins. Plovs | Price | ENGINE | | | Weight (Lbs.) | Traction Members, Dimensions, Diameter & Face (Ins.) | MAKE & MODEL | Drawbar-Pulley Rating | Recommended No. of 14 Ins. Plovs | Price | ENGINE | | | Weight (Lbs.) | Traction Members, Dimensions, Diameter & Face (Ins.) |
|-------------------------|-----------------------|----------------------------------|-------|-----------------|----------------------------|---------------|---------------|------------------------------------------------------|---------------------------|-----------------------|----------------------------------|-------|-------------|----------------------------|---------------|---------------|------------------------------------------------------|
| | | | | Make | No. of Cyls. Bore & Stroke | Weight (Lbs.) | | | | | | | Make | No. of Cyls. Bore & Stroke | Weight (Lbs.) | | |
| Allis-Chalmers... 6-12 | 1 | 8325 | LeLr. | 1-3 1/2 x 4 1/2 | 2500 | 48x 6 | | | Gray... EU | 22-40 | 4 | 2385 | Wau. | 4-5 x 6 1/2 | 6900 | | |
| Allis-Chalmers... 15-25 | 3 | 1285 | Mid. | 1-4 1/2 x 5 1/2 | 4700 | 46x12 | | | | | | | Own. | 2-5 1/2 x 6 1/2 | 4250 | 46x10 | |
| Allis-Chalmers... 20-35 | 4 | 1855 | Own. | 1-12 x 6 1/2 | 6150 | 50x12 | | | Hart-Parr... 20 | -20 | 2 | | Own. | 2-6 1/2 x 7 | 5220 | 52x10 | |
| Allwork... D 20-38 | 4-5 | 1093 | Own. | 1-5 x 7 | 6500 | 48x14 | | | Hart-Parr... (Road) | -30 | 3 | | Own. | 2-6 1/2 x 7 | 7500 | 52x18 | |
| Allwork... G 14-28 | 3 | 1105 | Own. | 1-4 1/2 x 6 | 4800 | 48x12 | | | Hart-Parr... 40 | -40 | 4 | | Own. | 4-6 1/2 x 8 1/2 | 7510 | 32x18 | |
| Allwork... C 16-30 | 3 | 1205 | Own. | 1-5 x 6 | 5200 | 48x12 | | | Heider... D | 9-16 | 2 | | Wau. | 1-4 1/2 x 5 1/2 | 4000 | 51x 8 | |
| Aultman-Taylor... 15-30 | 3-4 | 1900 | Cl. | 1-5 x 6 1/2 | 7800 | 70x12 | | | Heider... C | 12-20 | 3 | | Wau. | 4-4 1/2 x 6 1/2 | 6000 | 57x10 | |
| Aultman-Taylor... 22-45 | 4-6 | 3100 | Own. | 1-5 1/2 x 8 | 12500 | 70x20 | | | Heider... M | 5-10 | | | LeLr. | 4-3 1/2 x 4 1/2 | 2800 | 46x 6 | |
| Aultman-Taylor... 30-60 | 8-10 | 1400 | Own. | 1-7 x 9 | 22500 | 90x24 | | | Huber... (Light 4) | 12-25 | 3 | 995 | Wau. | 4-4 1/2 x 5 1/2 | 5000 | 60x10 | |
| Avery... 15 | 3-4 | | Own. | 1-4 1/2 x 6 | 4750 | 50x12 | | | Huber... (Super 4) | 15-30 | 3 | | Mid. | 4-4 1/2 x 6 | 6000 | 60x10 | |
| Avery... 20-35 | 4-5 | | Own. | 1-4 1/2 x 7 | 7500 | 60x16 | | | Lauson... S | 12-25 | 3 | | Mid. | 4-4 1/2 x 5 1/2 | 4200 | | |
| Avery... 25-50 | 5-6 | | Own. | 1-6 1/2 x 7 | 12500 | 69x20 | | | Lauson... T | 15-30 | 4 | | Bea. | 4-4 1/2 x 6 | 6200 | | |
| Avery... 45-65 | 8-10 | | Own. | 1-7 1/2 x 8 | 22000 | 87 1/2 x 21 | | | Leader... B | 12-18 | 2 | 375 | Ow. | 2-6 1/2 x 6 | 4800 | 50x12 | |
| Avery... Tr. Runner | 3 | | Own. | 1-4 x 5 1/2 | 5000 | x 8 1/2 | | | Leader... N | 16-32 | 3-4 | 1275 | Cl. | 4-5 x 6 | 5800 | 52x12 | |
| Avery... Road Racer | 3 | | Own. | 6-3 x 4 | 4600 | 42x 6 | | | Lincoln... A | 15-30 | 3 | 1600 | Bud. | 4-4 1/2 x 6 | 5000 | 40x14 | |
| Bates (St. Mule) H | 15-25 | 3 | Mid. | 1-4 1/2 x 5 1/2 | 3600 | 48x10 | | | Little Giant... B | 16-22 | 4 | | Ow. | 4-4 1/2 x 5 | 5200 | 54x14 | |
| Bates (St. Mule) F | 18-25 | 3 | Mid. | 1-4 1/2 x 5 1/2 | 4850 | 56x10 | | | Little Giant... A | 26-35 | 6 | | Ow. | 4-5 1/2 x 6 | 8700 | 66x20 | |
| Bates (St. Mule) G | 25-35 | 4 | Mid. | 1-4 1/2 x 6 | 6500 | 56x10 | | | Lombard... 100 | 12-16 | | | Ow. | 6-5 1/2 x 7 | 19000 | x12 | |
| Bates (St. Mule) 40 | 30-40 | 4 | Mid. | 1-4 1/2 x 6 | 8500 | 68x12 | | | London... 12-25 | 3 | | | Mid. | 4-4 1/2 x 5 1/2 | 48x12 | | |
| Best... B 25-35 | 4 | 1250 | Ste. | 1-4 1/2 x 6 1/2 | 6000 | 61x12 | | | McCork-Deering... 10-20 | 2 | 850 | Ow. | 4-4 1/2 x 5 | 3700 | 42x12 | | |
| Best... 30 | 20-30 | 4 | Ow. | 1-4 1/2 x 6 1/2 | 8100 | 68x11 1/2 | | | McCork-Deering... 15-30 | 3 | 1250 | Ow. | 4-4 1/2 x 6 | 5750 | 50x12 | | |
| Best... 60 | 10-60 | 9 | Ow. | 1-6 1/2 x 8 1/2 | 18580 | 89x20 | | | Minneapolis... 12-25 | 3 | | Ow. | 4-4 1/2 x 7 | 6900 | 56x12 | | |
| Bryan... Steam | 15-30 | 3 | 2385 | Ow. | 2-4 x 5 | 5500 | 52x12 | | Minneapolis... 17-30 | 3-4 | | Ow. | 4-4 1/2 x 7 | 6100 | 54x12 | | |
| Case... 12-20 | 3 | 895 | Ow. | 1-4 1/2 x 5 | 4230 | 42x12 | | | Minneapolis... 22-44 | 4-5 | | Ow. | 4-6 x 7 | 12110 | 62x20 | | |
| Case... 15-27 | 3-4 | 1350 | Ow. | 1-4 1/2 x 6 | 6600 | 52x14 | | | Minneapolis... 35-70 | 8-10 | | Ow. | 4-7 x 9 | 22500 | 85x30 | | |
| Case... 22-40 | 4-5 | 2650 | Ow. | 1-5 1/2 x 6 1/2 | 10700 | 56x16 | | | Moline (Un.)... D | 9-18 | 2-3 | 725 | Ow. | 4-3 1/2 x 5 | 3380 | 52x 8 | |
| Case... 40-72 | 8-10 | 4900 | Ow. | 1-7 x 8 | 21200 | 72x20 | | | Moline (Orc.)... D | 9-18 | 2-3 | 725 | Ow. | 4-3 1/2 x 5 | 3340 | 44x 8 | |
| Caterpillar... 2 Ton | 15 | 3 | Ow. | 1-4 x 5 1/2 | 4000 | * | | | Monarch... C | 20-30 | 4 | 3800 | Bea. | 4-4 1/2 x 6 | 8700 | 66x12 | |
| Caterpillar... 5 Ton | 25 | 4 | Ow. | 1-4 1/2 x 6 | 9400 | * | | | Monarch... E | 25-40 | | 5000 | Bea. | 4-4 1/2 x 6 | 12000 | 67x12 | |
| Caterpillar... 10 Ton | 40 | 6 | Ow. | 1-6 1/2 x 7 | 20000 | * | | | Monarch... D | 35-60 | | 6000 | Bea. | 4-4 1/2 x 6 | 15000 | 79x12 | |
| Cletrac... F 9-16 | 2 | 815 | Ow. | 1-3 1/2 x 4 1/2 | 1930 | 42x 5 1/2 | | | Nichols-Shepard... 20-42 | 4-6 | 2600 | Ow. | 2-8 x 10 | 13500 | 64x20 | | |
| Cletrac... W 12-20 | 2 | 1345 | Ow. | 1-4 x 5 1/2 | 3455 | 48x 8 | | | Nichols-Shepard... 25-50 | 6-8 | 3320 | Ow. | 2-9 x 12 | 20500 | 69x28 | | |
| Eagle... H 16-30 | 4 | | Ow. | 2-7 x 8 | 5850 | 48x12 | | | Nichols-Shepard... 35-70 | 8-12 | 4030 | Ow. | 2-10 x 14 | 30000 | 73x32 | | |
| E-B... AA 12-20 | 3 | | Ow. | 1-4 1/2 x 5 | 4550 | 51x12 | | | Pioneer... G 18-36 | 4 | | Ow. | 4-5 1/2 x 6 | 6500 | 60x18 | | |
| E-B... Q 12-20 | 3 | | Ow. | 1-4 1/2 x 5 | 6500 | 60x12 | | | Pioneer... C 40-75 | 10 | | Ow. | 4-7 x 8 | 24000 | 90x21 | | |
| E-B... 16-32 | 4 | | Ow. | 1-5 1/2 x 7 | 9400 | 72x16 | | | Rumely OilPull... K 12-20 | 3 | | Ow. | 2-6 x 8 | 6638 | 51x12 | | |
| Fagel... 19-12 | 2 | 1200 | Lye. | 4-3 1/2 x 5 | 3600 | 48x 8 | | | Rumely OilPull... H 16-30 | 4 | | Ow. | 2-7 x 8 1/2 | 9505 | 56x16 | | |
| Fordson... 18 | 2 | 420 | Ow. | 4-4 x 5 | 2562 | 42x12 | | | Rumely OilPull... G 20-40 | 5 | | Ow. | 2-8 x 10 | 12938 | 64x20 | | |
| Frisk... A 12-20 | 2 | 1000 | ErL. | 4-4 x 6 | 5800 | 60x10 | | | | | | | | | | | |
| Frisk... C 15-28 | 3 | 1690 | Bea. | 1-4 1/2 x 6 | 6730 | 60x12 | | | | | | | | | | | |

| GARDEN TRACTORS | | | | | | | | | | | | | | | |
|---------------------|-----------------------|----------------------------------|-------|-----------------|----------------------------|---------------|---------------|------------------------------------------------------|--|--|--|--|--|--|--|
| MAKE & MODEL | Drawbar-Pulley Rating | Recommended No. of 14 Ins. Plovs | Price | ENGINE | | | Weight (Lbs.) | Traction Members, Dimensions, Diameter & Face (Ins.) | | | | | | | |
| | | | | Make | No. of Cyls. Bore & Stroke | Weight (Lbs.) | | | | | | | | | |
| Rumely OilPull... E | 30-60 | 8-10 | | Ow. | 2-10 x 12 | 26000 | 80x30 | | | | | | | | |
| Russell... 15-30 | 3-4 | | | Cl. | 4-5 x 6 1/2 | 6000 | 56x14 | | | | | | | | |
| Russell... 20-40 | 4-5 | | | Cl. | 4-5 1/2 x 7 | 7900 | 60x16 | | | | | | | | |
| Russell... 30-60 | 8-10 | | | Ow. | 4-8 x 10 | 22550 | 84x22 | | | | | | | | |
| Shaw-Enechs (Gr.) | | | | LeLr. | 4-3 1/2 x 4 1/2 | 4400 | 48x 8 | | | | | | | | |
| Topp-Stewart... B | 30-45 | 4 | | Wau. | 4-4 1/2 x 6 1/2 | 7800 | 42x12 | | | | | | | | |
| Toro... 6-10 | 2 | \$675 | | LeLr. | 4-3 1/2 x 4 1/2 | 2900 | 41x 9 | | | | | | | | |
| Townsend... 10-20 | 2-3 | | 800 | Ow. | 2-6 1/2 x 7 | 4500 | 48x12 | | | | | | | | |
| Townsend... 15-30 | 3-4 | 1350 | Ow. | 2-7 x 8 | 6500 | 56x18 | | | | | | | | | |
| Townsend... 25-50 | 4-8 | 2250 | Ow. | 2-8 1/2 x 10 | 11500 | 60x24 | | | | | | | | | |
| Traylor... 6-12 | 1 | 500 | LeLr. | 4-3 1/2 x 4 1/2 | 1750 | 38x10 | | | | | | | | | |
| Twin City... 12-20 | 3 | 1200 | Ow. | 1-4 1/2 x 6 | 4700 | 50x12 | | | | | | | | | |
| Twin City... 20-35 | 5 | 2750 | Ow. | 4-5 1/2 x 6 1/2 | 8400 | 60x20 | | | | | | | | | |
| Twin City... 40-65 | 8 | 4750 | Ow. | 4-7 1/2 x 9 | 23700 | 84x24 | | | | | | | | | |
| Uncle Sam... C-20 | 12-20 | 2-3 | | Her. | 4-4 x 5 | 3000 | 46x12 | | | | | | | | |
| Uncle Sam... B-19 | 20-30 | 3-4 | | Bea. | 4-4 1/2 x 6 | 4650 | 50x12 | | | | | | | | |
| Uncle Sam... D-21 | 20-30 | 3-4 | | Bea. | 4-4 1/2 x 6 | 4600 | 50x12 | | | | | | | | |
| Wallis... OK | 15-27 | 3 | | Ow. | 4-4 1/2 x 5 1/2 | 3660 | 48x12 | | | | | | | | |
| Waterloo Boy... N | 12-25 | 3 | | Ow. | 2-6 1/2 x 7 | 5869 | 52x12 | | | | | | | | |
| Wisconsin... 16-30 | 3-4 | 1750 | Cl. | 4-5 x 6 1/2 | 5600 | 52x12 | | | | | | | | | |
| Wisconsin... 22-40 | 4-5 | 2550 | Cl. | 4-5 1/2 x 7 | 7500 | 52x12 | | | | | | | | | |
| Yuba (Ball Tread) | 15-25 | 4 | 2750 | Wis. | 4-4 1/2 x 6 | 5750 | 52x12 | | | | | | | | |
| Yuba (Ball Tread) | 25-40 | 8 | 4500 | Ow. | 4-5 1/2 x 7 | 10130 | 68x17 1/2 | | | | | | | | |

GARDEN TRACTORS

| | | | | | | | | |
|-------------------|-----------|-------------|---|-------|------|-----------------|------|----------------|
| Aro. | F | 3-6 | 1 | \$385 | Own. | 1-4 1/2 x 5 | 1000 | 30x 4 |
| Beeman. | Jr. | 1 1/2-4 | 1 | 195 | B&S. | 1-2 1/2 x 2 1/2 | 210 | 30x 3 |
| Beeman. | K | 1 1/2-4 | 1 | 265 | Ow. | 1-3 1/2 x 4 1/2 | 550 | 25x 3 1/2 |
| Bolens. | | 1 1/2-4 | 1 | 180 | B&S. | 1-2 1/2 x 2 1/2 | 200 | 16x 3 |
| Centaur. | 1923 | 2 1/2-5 1/2 | 1 | 315 | N-W. | 1-4 1/2 x 4 1/2 | 800 | 28x 4 |
| Do-It-All. | (Jack) | 2 1/2-6 | 1 | 395 | Ow. | 1-3 1/2 x 3 1/2 | 750 | |
| Do-It-All. | (Baby) | 2 1/2-6 | 1 | 495 | Ow. | 1-4 1/2 x 6 | 1200 | 26x 2 1/2 |
| Do-It-All | (Twin 12) | 4-15 | 1 | 495 | Ow. | 2-3 1/2 x 3 1/2 | 800 | 32x 4 |
| Kinkade. | | 1 1/2-3 | 1 | 190 | Ow. | 1-3 x 3 | 180 | 22x 5 1/2 |
| M.B.M. Red. | E | 1 1/2-4 | 1 | 250 | Ow. | 1-3 1/2 x 4 | 410 | 20x 3 |
| Motor Maculivator | | | | 148 | Ow. | 1-2 1/2 x 3 1/2 | 210 | 19x 3 1/2 |
| N.B. | 2 | 6 | 1 | 375 | Ow. | 2-2 1/2 x 4 | 750 | 32x 4 |
| Utilitor. | 501 | 2 1/2-4 | 1 | 295 | Ow. | 1-3 1/2 x 4 1/2 | 750 | 24 1/2 x 3 1/2 |
| Utilitor. | 501A | 2 1/2-4 | 1 | 340 | Ow. | 1-3 1/2 x 4 1/2 | 925 | 24 1/2 x 3 1/2 |

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

| PRICES | | | | | | Wheel Base (Ins.) | Tire Size (Ins.) | NAME AND MODEL | ENGINE | | | ELECTRICAL SYSTEM | | Clutch Type and Make | Gearset Make | Universal Type and Make | REAR AXLE | | BRAKES, Service and Emergency | | | | |
|-------------|-----------|-----------|---------------|-----------|-----------|-------------------|------------------|----------------|-----------------------|------------------------------|-------------------------------|-------------------|----------------------------|----------------------|--------------|-------------------------|---------------|---------------|-------------------------------|---------------|--------------|-------|-----|
| OPEN MODELS | | | CLOSED MODELS | | | | | | Make and Model | No. of Cyls. Bore and Stroke | Horse Power Rating (N.A.A.C.) | Carburetor Make | Generator and Starter Make | | | | Ignition Make | Type and Make | | Gear Ratio | | | |
| 2-3 Pass. | 4-5 Pass. | 6-7 Pass. | Sport Models | 2-3 Pass. | 4-5 Pass. | 6-7 Pass. | | | | | | | | | | | | | | | | | |
| \$1950 | \$1695 | \$1760 | \$1850d | d2195f | \$2350 | \$2550d | 127 | 33x4 1/2 | American.....D-66 | H-S. 11000 | 6-3 1/2 x 5 | 29.40 | Strom... | G-D... | A-K... | s-p | B & B. | B & B. | m Hart. | F Salis | 4.50 | R-R | |
| | 1195 | | 1445c | 1425 | 1495 | d1895p | 115 | 32x4* | Anderson.....41 | Cont...7 U | 6-3 1/2 x 4 1/2 | 23.44 | Zenith. | West... | West... | s-p | B & B. | Durston. | f Univ. | 3 1/2 F Salis | 4.75 | R-T | |
| | | 1595 | | | | | 122 | 32x4* | Anderson.....50 | Cont...8 R | 6-3 1/2 x 4 1/2 | 27.34 | Zenith. | Remy... | Remy... | s-p | B & B. | Durston. | f Univ. | 3 1/2 F Salis | 1.50 | R-T | |
| | 1395 | | | | 1995 | | 120 | 32x4* | Apperson.....6 | Falls..... | 6-3 1/2 x 4 1/2 | 23.44 | Strom... | Remy... | Remy... | s-p | Rock. | Mech... | m Thie. | 3 1/2 F Col. | 5.10 | R-R | |
| | 2485 | 2485 | | | 3385 | 3385 | 130 | 33x5 | Apperson.....8-23-S | Own..... | 8-3 1/2 x 5 | 33.80 | Johnson | Bijur... | Remy... | m-d | Own. | Own... | m Thie. | 3 1/2 F Own | 4.25 | R-R | |
| | 1095 | | 1365d | 1695d | 1595 | 1845d | 114 | 31x4* | Auburn.....6-43 | Cont...7 U | 6-3 1/2 x 4 1/2 | 23.44 | Strom. | Remy... | Remy... | s-p | B & B. | Warner | m Univ. | 3 1/2 F Col. | 4.63 | R-T | |
| | 1695 | | 1935d | | 2245f | 2445 | 124 | 32x4 1/2 | Auburn.....6-63 | Own..... | 6-3 1/2 x 5 | 25.35 | Strom... | Remy... | Remy... | s-p | B & B. | Warner | m Thie. | 3 1/2 F Col. | 4.63 | R-T | |
| | 1395 | | 1495d | 1685d | 1850 | | 118 | 32x4 | Barley.....6-50 | H-S.....40 | 6-3 1/2 x 5 | 25.35 | Strom... | Delco... | Delco... | s-p | B & B. | Fuller. | f M&E. | 3 1/2 F Col. | 5.10 | F-R | |
| | | | | | 12250p | | | | | | | | | | | | | | | | | | |
| | 935 | 965 | 800c | 1395c | 1495 | | 109 | 31x4 | Buick.....1924 | Own..... | 4-3 1/2 x 4 1/2 | 18.23 | Marvel. | Delco... | Delco... | m-d | Own. | Own... | m Own. | 3 1/2 F Own | 4.66 | F-L | |
| | 1275 | 1295 | 1135g | 1995c | 1695 | | 120 | 32x4 | Buick.....1924 | Own..... | 6-3 1/2 x 4 1/2 | 27.34 | Marvel. | Delco... | Delco... | m-d | Own. | Own... | m Own. | 3 1/2 F Own | 4.10 | F-L | |
| | | | | | 2095 | | | | | | | | | | | | | | | | | | |
| | 1385g | | 1675a | 1945c | 2235f | 2285 | 128 | 32x4 1/2 | Buick.....1924 | Own..... | 6-3 1/2 x 4 1/2 | 27.34 | Marvel. | Delco... | Delco... | m-d | Own. | Own... | m Own. | F Own | 4.70 | F-R | |
| | | | 1725d | | 2385d | 2795f | | | | | | | | | | | | | | | | | |
| | 3085 | 3085 | 3085 | | 3875 | 3950 | 132 | 33x5 | Cadillac.....V 63 | Own..... | 8-3 1/2 x 5 1/2 | 31.25 | Own. | Delco... | Delco... | m-d | Own. | Own... | m Spicer | F Tim | Opt. | F-R | |
| | | | | | 4150 | 4600f | | | | | | | | | | | | | | | | | |
| | 1750 | 1790 | | 2230d | 2480c | 2575 | 122 | 32x4 1/2 | Case.....X | Cont...8 R | 6-3 1/2 x 4 1/2 | 27.34 | Schebler. | Delco... | Delco... | m-d | Own. | Own... | f Sneed. | 3 1/2 F Col. | 4.90 | R-R | |
| | | | | 2475 | | 3325 | 132 | 33x5 | Case.....Y | Cont...6 T | 6-3 1/2 x 5 1/2 | 31.54 | Rayfield. | Delco... | Delco... | m-d | Own. | Own... | f Sneed. | 3 1/2 F Col. | 4.70 | R-R | |
| | 1185 | | 1335d | | 1535 | | 117 | 32x4 | Chalmers.....1923 | Own..... | 6-3 1/2 x 4 1/2 | 25.35 | Strom. | A-L... | A-L... | m-d | Own. | Own... | m Mech. | 3 1/2 F Tim | 5.13 | R-R | |
| | | | | 1295 | | | 122 | 32x4 | Chalmers.....1923 | Own..... | 6-3 1/2 x 4 1/2 | 25.35 | Strom. | A-L... | A-L... | m-d | Own. | Own... | m Mech. | 3 1/2 F Tim | 5.13 | R-R | |
| | 1595 | 1485 | 1635 | 1785c | 1895d | 1745 | 123 | 32x4* | Chandler.....Six | Own..... | 6-3 1/2 x 5 | 29.40 | Strom... | Bosch. | Bosch. | s-p | B & B. | Own. | m Own. | 3 1/2 F Own | 4.45 | R-T | |
| | | 1685 | | 2095f | 2270 | 2995f | | | | | | | | | | | | | | | | | |
| | 490 | 495 | 395g | | 640 | 795 | 103 | 30x3 1/2 | Chevrolet...Superior | Own..... | 4-3 1 1/2 x 4 | 21.76 | Zenith. | Remy... | Remy... | e | Own. | Own... | m Own. | 3 1/2 F Own | 3.77 | R-R | |
| | | | | | | 725c | | | | | | | | | | | | | | | | | |
| | 1525 | 1335 | 1395d | | d1795f | 1625 | 1895d | 29x4 1/2 | Chrysler.....Six | Own..... | 6-3 x 4 1/2 | 21.60 | Holley | A-L... | Remy... | m-d | Own. | Own... | m Detr. | 3 1/2 F Own | 4.60 | F-L | |
| | 1085 | 1045 | | 1145d | 1245 | 1295 | 112 1/2 | 31x4* | Cleveland.....42 | Own..... | 6-3 1 1/2 x 4 1/2 | 22.50 | Strom... | Bosch. | Bosch. | s-p | B & B. | Own. | m Mech. | 3 1/2 F Own | 4.90 | R-T | |
| | | | | 1295d | 1345 | 1395 | | | | | | | | | | | | | | | | | |
| | 2175 | 2175 | 2175 | 2475 | 2750c | 3075 | d3075f | 127 1/2 | Cole.....Master | Nort.M311 | 8-3 1/2 x 4 1/2 | 39.20 | Johnson. | Delco... | Delco... | m-d | Nort. | Nort... | m Spicer | F Col. | 4.70 | R-R | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 1475 | | | 1195d | 1395 | 1495 | 1650d | 115 | 32x4* | Columbia...Big Six | Cont...8 R | 6-3 1/2 x 4 1/2 | 27.34 | Strom... | A-L... | A-K... | s-p | B & B. | Durston. | m Spicer | 3 1/2 F Tim | 4.75 | R-R |
| | 995 | 995 | | 1195d | 1395 | 1495 | 1650d | 115 | 31x4* | Columbia...Light Six | Cont...7 U | 6-3 1/2 x 4 1/2 | 23.44 | Strom... | A-L... | A-L... | s-p | B & B. | Durston. | m Spicer | 3 1/2 F Tim | 5.10 | R-T |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 1395p | 1295 | | 1595c | 1495 | 2195p | 1895f | 116 | 32x4 | Courier..... | Falls. 8000 | 6-3 1/2 x 4 1/2 | 23.44 | Strom... | West... | A-K... | s-p | B & B. | Muncie. | f Flex. | 3 1/2 F Col. | 5.10 | R-R |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 3100 | 3100 | | | | 4500 | 138 | 33x4 1/2 | Crawford...23-6-70 | Cont...6 T | 6-3 1/2 x 5 1/2 | 31.54 | Zenith. | West... | Bosch. | m-d | B-L. | B-L... | m Spicer | 3 1/2 F Tim | ..... | R-R | |
| | | | 3500c | | 4500 | | 138 | 33x5 | Crawford-Dagmar.6-70 | Cont...6 T | 6-3 1/2 x 5 1/2 | 31.54 | Zenith. | West... | Bosch. | m-d | B-L. | B-L... | m Spicer | 3 1/2 F Tim | ..... | R-R | |
| | 5800 | 6300 | | | 7050 | | 142 | 33x5 | Cunningham...V4 | Own..... | 8-3 1/2 x 5 | 45.00 | Strom... | Delco... | Delco... | m-d | Own. | Own... | f Sneed. | F Tim | 4.23 | R-R | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 5000 | 4650 | 4700 | 4650c | 6350 | 6450 | 132 | 33x5 | Daniels.....23-38 | Own..... | 8-3 1/2 x 5 1/2 | 39.20 | Zenith. | Delco... | Delco... | m-d | Own. | Own... | m Spicer | F Tim | 4.23 | R-R | |
| | | | 4800 | | 5630 | | | | | | | | | | | | | | | | | | |
| | 5000 | 5150 | | 6000c | 6600 | 6800 | 138 | 33x5 | Daniels.....23-38 | Own..... | 8-3 1/2 x 5 1/2 | 39.20 | Zenith. | Delco... | Delco... | m-d | Own. | Own... | m Spicer | F Tim | 4.23 | R-R | |
| | 1295 | 1495 | | 1495c | 1595 | 1795c | 115 | 31x4* | Davis.....71 | Cont...7 U | 6-3 1/2 x 4 1/2 | 23.44 | Strom... | Delco... | Delco... | s-p | B & B. | Warner. | m Peters | 3 1/2 F Tim | 5.10 | R-R | |
| | | | | | | | 118 | | Davis.....81 | Cont...8 R | 6-3 1/2 x 4 1/2 | 27.34 | Strom... | Delco... | Delco... | s-p | B & B. | Warner. | m Peters | 3 1/2 F Tim | 5.10 | R-R | |
| | 850 | 880 | 1045d | 1035 | 1250 | 1545d | 116 | 32x4* | Dodge Brothers. | Own..... | 4-3 1/2 x 4 1/2 | 24.03 | Stewart. | N.E. | N.E. | m-d | Own. | Own... | m Own. | 3 1/2 F Own | 4.54 | R-R | |
| | | | | 1385 | 1355c | | | | | | | | | | | | | | | | | | |
| | 1950 | 3950 | 4150c | 4985c | 5550 | 5900 | 136 | 32x6 | Dorris.....6-80 | Own..... | 6-4 x 15 | 38.40 | Strom... | West... | Bosch. | m-d | Own. | B-L... | m Spicer | 3 1/2 F Tim | 3.77 | R-R | |
| | 1095 | | 1245c | 1535d | 1595 | d1335f | 115 | 31x4* | Dart.....27 | Falls.T8000 | 6-3 1/2 x 4 1/2 | 23.44 | Carter. | Bosch. | Bosch. | m-d | Det. | Own... | m Ther. | 3 1/2 F Fln. | 4.66 | R-R | |
| | 6500 | 6250 | 6750 | 6500c | d7800f | 7500 | 134 | 33x5 | Duesenberg Straight 8 | Own..... | 8-2 1/2 x 5 1/2 | 26.45 | Strom... | Delco... | Delco... | s-p | Own. | Own... | f Chi. | 3 1/2 F Own | 4.45 | F-R | |
| | 840 | 850 | 1065d | 1305 | 1365 | 7800 | 109 | 31x4 | Durant.....A-22 | Cont. Spec | 4-3 1/2 x 4 1/2 | 24.03 | Tillotson | A-L... | A-L... | s-p | Own. | Warner. | m Spicer | 3 1/2 F Ad. | 4.33 | R-R | |
| | | | | 1465 | | | | | | | | | | | | | | | | | | | |
| | 820 | | | | | | 118 | | Eagle.....6 | Cont.Spec. | 6-3 1/2 x 4 1/2 | 23.44 | Strom... | Wagner | Wagner | s-p | B & B. | Detr. | m Spicer | 3 1/2 F Tim | 4.80 | ..... |  |
| | 1485 | 1095 | 1275d | 1395c | 1595 | | 112 | 32x4 | Earl.....40 | Own..... | 4-3 1/2 x 5 1/2 | 18.91 | Scoe... | A-L... | Conn... | s-p | B & B. | Own... | f Own. | 3 1/2 F Own | 4.87 | R-T | |
| | | 995 | 1195d | | 1265f | p1625d | 112 | 31x1* | Elcar.....4-40 | Own..... | 4-3 1/2 x 5 | 21.03 | Strom... | Delco... | Delco... | s-p | B & B. | Warner | m Peters | 3 1/2 F Salis | 1.50 | R-R | |
| | 1395 | | 1595f | 1995f | p2195d | 3000d | 118 | 32x4* | Elcar.....6-60 | Cont...8 R | 6-3 1/2 x 4 1/2 | 27.34 | Strom... | Delco... | Delco... | s-p | B & B. | Warner. | m Spicer | 3 1/2 F Salis | 4.40 | R-R | |
| | 1895 | | | 2145 | 2345 | d3900d | 118 | 32x4* | Elgin..... | Falls.Spec. | 6-3 1/2 x 4 1/2 | 23.44 | Strom... | DeJon. | DeJon. | s-p | B & B. | Warner. | f | 3 1/2 F Tim | 4.53 | F-T | |
| | 850 | | | | 975 | | 110 1/2 | 31x3 1/2 | Essex..... | Own..... | 6-2 1/2 x 4 | 16.54 | Own. | Bosch. | Bosch. | m-d | Own. | Own... | m Spicer | 3 1/2 F Own | 5.40 | R-R | |
| | 1295 | | 1295 | 1895c | 2035 | 32x4 1/2 | 120 | 32x4 1/2 | Flint..... | Cont. Spec | 6-3 1/2 x 5 | 27.31 | Strom... | DeJon. | DeJon. | s-p | Own. | Warner. | m Spicer | 3 1/2 F Ad. | ..... | R-R | |
| | 235f | 295g | 230g | | 525 | 590d | 100 | 30x3 1/2 | Ford.....T | Own..... | 4-3 1/2 x 4 | 22.50 | Own... | Own... | Own... | m-d | Own. | Own... | m Own. | 3 1/2 F Own | 3.63 | T-R | |
| | | | | | | | | | | | | | | | | | | | | | | | |



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| PRICES | | | | | | Wheel Base (Ins.) | Tire Size (Ins.) | NAME AND MODEL | ENGINE | | | | ELECTRICAL SYSTEM | | Clutch, Type and Make | Gearset Make | Universal, Type and Make | REAR AXLE | | BRAKES, Service and Emergency | |
|-------------|-----------|-----------|---------------|-----------|-----------|-------------------|-------------------|----------------------|--------------------|-------------------------------------|-------------------------------|-----------------|----------------------------|---------------|-----------------------|--------------|--------------------------|---------------|------------|-------------------------------|-------|
| OPEN MODELS | | | CLOSED MODELS | | | | | | Make and Model | No. of Cyls. Bore and Stroke | Horse Power Rating (N.A.A.C.) | Carburetor Make | Generator and Starter Make | Ignition Make | | | | Type and Make | Gear Ratio | | |
| 2-3 Pass. | 4-5 Pass. | 6-7 Pass. | Sport Models | 2-3 Pass. | 4-5 Pass. | 6-7 Pass. | | | | | | | | | | | | | | | |
| 5000 | 5000 | 5000 | 4200g | 6300 | 6500 | 132 | 33x5* | LaFayette. | Own. | 8-3 1/2 x 5 1/2 | 33.80 | Johnson | Delco. | Delco. | m-d Own. | Own. | m Own. | F Own | 4.58 | RL-R2 | |
| 1895 | 1895 | 1895 | 2145d | 2395f | 2295 | 119 | 32x4* | Lexington. Concord | Ansted-M. | 6-3 1/2 x 4 1/2 | 26.30 | Rayfield. | G-D. | Conn. | s-p Long. | Warner. | f Snead. | 1/2 F Sals | 5.10 | RL-T1 | |
| 3800 | 3800c | 3800 | | 4600c | 4400 | 123 | 32x4 1/2 | Lexington. 23 | Anst. M | 6-3 3/4 x 4 1/2 | 26.30 | Rayfield. | G-D. | Conn. | s-p Long. | Warner. | f Snead. | 1/2 F Sals | 5.10 | RL-T1 | |
| 8090 | 7900 | 7900 | | 11750 | 11600 | 136 | 33x5* | Lincoln. | Own. | 8-3 3/4 x 5 | 36.45 | Strom. | Delco. | Delco. | m-d Own. | Own. | m Spicer | F Tim | 1.58 | RL-R2 | |
| 2300g | 2785 | 2785 | 2985a | 3585 | 4285f | 142 | 35x5 | Locomobile. Series 8 | Own. | 6-4 1/2 x 5 1/2 | 48.60 | Ball&B. | West. | Delco. | m-d Own. | Own. | m Own. | F Own | 3.85 | RL-R2 | |
| 795 | 795 | | 2985c | 3985 | 3985 | 136 | 32x4 1/2 | Marmont. 34 | Own. | 6-3 3/4 x 5 1/2 | 33.75 | Strom. | Delco. | Delco. | m-d Own. | Own. | m Spicer | 3/4 F Own | 4.10 | RL-R2 | |
| 2500 | 2500 | | 895b | 1195 | 1585d | 109 | 31x4 | Maxwell. | Own. | 4-3 3/4 x 4 1/2 | 21.03 | Stewart. | Remy. | Remy. | s-p Mech. | Own. | f Own. | 1/2 F Own | 4.60 | RL-T1 | |
| 5400 | 5600 | 5700 | 975d | 1295 | 1045d | 127 | 32x4 1/2 | McFarlan. | Own. | 6-3 3/4 x 5 | 27.34 | Rayfield. | Delco. | Delco. | m-d | Own. | 1/2 F | | | | |
| 1205 | 1295 | | 1495d | 1685c | 1695 | 140 | 33x5 | McFarlan. 1923 | Own. | 6-4 1/2 x 5 | 48.60 | Rayfield. | West. | West. | m-d M&E. | B-L. | m Peters | F Tim | 3.75 | RL-R2 | |
| | | | | 1895 | | 115 | 31x4* | Moon. U6-40 | Cont. 7 U | 6-3 1/2 x 4 1/2 | 23.41 | Strom. | Delco. | Delco. | s-p B&B. | Warner. | m Spicer | 1/2 F Tim | 5.10 | RL-T1 | |
| | 1785 | 2150 | | 2585 | 2485 | 128 | 32x4 1/2 | Moon. 6-58 | Cont. 8 R | 6-3 3/4 x 4 1/2 | 27.34 | Strom. | Delco. | Delco. | s-p B&B. | R-L. | m Spicer | 1/2 F Tim | 5.00 | RL-R2 | |
| 1240 | 1240 | 1050g | 1615c | 2090c | 1640 | 130 | 31x4 | Moon. | Cont-Spec. | 6 | | | Delco. | Delco. | s-p B&B. | Warner. | m Spicer | 1/2 F Tim | | | |
| | 995 | | | 2090c | 2040 | 121 | 33x4 | Nash. 691-3-6-7 | Own. | 6-3 1/4 x 5 | 25.35 | Marvel. | Delco. | Delco. | s-p B&B. | Own. | m Own. | 1/2 F Own | 4.50 | RL-T1 | |
| 915 | 935 | | 1195d | 1890 | 2190 | 127 | 34x4 1/2 | Nash. 692-4-5-8 | Own. | 6-3 1/2 x 5 | 25.35 | Marvel. | Delco. | Delco. | s-p B&B. | Own. | m Own. | 1/2 F Own | 4.90 | RL-T1 | |
| 2175 | 2475c | 2375 | 2485d | 3250 | 3285 | 112 | 33x4 | Nash. 41-8 | Own. | 4-3 3/4 x 5 | 18.23 | Marvel. | Delco. | Delco. | s-p B&B. | Own. | m Own. | 1/2 F Own | 4.88 | RL-T1 | |
| 2500 | 2500c | 2600c | | 3500 | | 130 | 32x4 1/2 | National. BB | Own. | 6-3 1/2 x 5 1/2 | 29.40 | Rayfield. | West. | Delco. | s-p B&B. | B-L. | m Univ. | F Col. | 4.08 | RL-R2 | |
| 945 | 915 | | 1095a | 1195 | 1345 | 128 | 33x5 | Noma. 4C | Cont. 8 R | 6-3 3/4 x 4 1/2 | 27.34 | Zenith. | Delco. | Delco. | s-p B&B. | Detroit. | m Spicer | 1/2 F Tim | 4.45 | RL-R2 | |
| 750 | 750 | | 1095d | 1395 | | 113 | 31x4 | Oakland. 6-54 | Own. | 6-2 1/2 x 4 1/2 | 18.90 | Strom. | Remy. | Remy. | s-p Hoos. | Muncie. | m Mech. | 1/2 F Tim | 4.70 | RL-T1 | |
| 495 | 495 | | 885d | 1035 | | 110 | 31x4 | Oldsmobile | 30 | Own. | 6-2 3/4 x 4 1/2 | 18.15 | Zenith. | Delco. | Delco. | s-p B&B. | Muncie. | f Own. | 1/2 F Own | 5.10 | RL-T1 |
| | 695 | | 395g | 750 | 795 | 100 | 30x3 1/2 | Overland. 91 | Own. | 4-3 1/2 x 4 | 19.60 | Tillotson | A-L. | A-L. | s-p B&B. | Own. | m Own. | 1/2 F Own | 4.50 | RL-R2 | |
| | | | | 795 | 695d | 106 | 30x3 1/2 | Overland. 92 | Own. | 4-3 1/2 x 4 | 19.60 | Tillotson | A-L. | A-L. | s-p B&B. | Own. | m Own. | 1/2 F Own | 4.50 | RL-R2 | |
| 2585 | 2585 | 2350g | 2750c | 3275f | 3375 | 126 | 33x4 1/2 | Packard. 126 | Own. | 6-3 3/4 x 5 | 27.34 | Own. | A-K. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Own | 4.66 | F2-R2 | |
| 3850c | 3650 | 2785 | 2450g | 3625f | 3675f | 133 | 33x4 1/2 | Packard. 133 | Own. | 6-3 3/4 x 5 | 27.34 | Own. | A-K. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Own | 4.66 | F2-R2 | |
| | | 3850 | 4550c | 4725 | 4700f | 136 | 33x5 | Packard "Eight". 136 | Own. | 8-3 3/4 x 5 | 36.45 | Own. | Dyneto. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Own | 4.70 | F2-R2 | |
| | 2450 | 2450 | | 4900f | 4950f | 143 | 33x5 | Packard "Eight". 143 | Own. | 8-3 3/4 x 5 | 36.45 | Own. | Dyneto. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Own | 4.70 | F2-R2 | |
| | | | | 3235 | 3235f | 131 | 33x4 1/2 | Paige. 6-70 | Cont. 9 A | 6-3 3/4 x 5 | 33.75 | Rayfield. | Remy. | A-K. | m-d Long. | Warner. | m Mech. | 1/2 F Tim | 4.90 | RL-R2 | |
| | | | | 2850f | 3435f | | | | | | | | | | | | | | | | |
| 1550 | 1390 | 1425 | 1465d | 2395f | 2395 | 120 | 32x4 1/2 | Paterson. 23-6-52 | Cont. 8 R | 6-3 3/4 x 4 1/2 | 27.34 | Strom. | Delco. | Delco. | s-p B&B. | Durston. | m Hart. | 1/2 F Sals | 4.50 | RL-R2 | |
| 1985 | 1985 | 2750 | 2260g | 3300 | 3390 | 126 | 32x4 | Peerless. Six | Own. | 6-3 3/4 x 5 | 29.40 | Ball&B. | Delco. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Tim | 4.90 | RL-R2 | |
| | 2690 | 2750 | 3300 | 3390 | 3840 | 128 | 33x5* | Peerless. 66 | Own. | 8-3 1/4 x 5 | 33.80 | Ball&B. | Delco. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Tim | 4.90 | RL-R2 | |
| 5250 | 5250 | 5250 | 6800 | 6900 | 6800 | 138 | 33x5 | Pierce-Arrow. | Own. | 6-4 x 5 1/2 | 38.40 | Own. | Delco. | Delco. | m-d Own. | Own. | m Spicer | 1/2 F Own | 4.29 | RL-R2 | |
| | 1695 | 1745 | 1745 | 2445 | 2495f | 126 | 32x4 1/2 | Pilot. 6-56 | H-S. 90 | 6-3 1/2 x 5 | 25.35 | Tillotson | Wagner | Wagner | s-p Hoos. | Muncie. | m Blood. | 3/4 F Col. | 4.67 | RL-R2 | |
| 2535 | 2585 | 2585d | 2635d | 3385 | 3585 | 126 | 32x4 1/2 | Premier. 6-D | Own. | 6-3 3/4 x 5 1/2 | 27.34 | Strom. | Delco. | Delco. | s-p B&B. | Own. | m Spicer | 1/2 F Tim | 4.58 | RL-R2 | |
| | 2300 | 2350 | 2400c | 3000d | 3050 | 124 | 32x4 1/2 | R & V Knight. H | Own. Kn't | 6-3 1/2 x 4 1/2 | 29.40 | Strom. | A-L. | A-L. | s-p B-L. | B-L. | m Spicer | 1/2 F Tim | 5.20 | RL-R2 | |
| | 1335 | 1545d | | 1875 | d2235f | 120 | 32x4* | Reo. T6 | Own. | 6-3 1/2 x 5 | 24.34 | Rayfield. | N.E. | N.E. | m-d Own. | Own. | m Own. | 1/2 F Own | 4.70 | RL-R2 | |
| | | | | 1985 | | | | | | | | | | | | | | | | | |
| 3200c | 3200 | | 3200c | 4000 | | 131 | 32x4 1/2 | Revere. M | [Dues. 4 Mensen. 4 | 4-4 1/2 x 6 28.90 4-4 1/2 x 6 30.63 | 28.90 30.63 | Strom. | West. | Bosch. | m-d B-L. | B-L. | m Spicer | 3/4 F Stnd | 3.44 | RL-R2 | |
| 1635 | 1585 | | 2035 | 2135 | 117 | 32x4* | Rickenbacker. B | Own. | 6-3 3/4 x 5 1/2 | 27.34 | 27.34 | Strom. | Bosch. | Bosch. | s-p Own. | Warner. | m Mech. | 3/4 F Col. | 5.10 | F2-T1 | |
| 2685 | 2485 | 2685 | 2750c | 3285 | 3585 | 128 | 32x4 1/2 | Roamer. 6-54-E | Cont. 12XD | 6-3 1/2 x 5 1/2 | 29.40 | Strom. | West. | Split. | s-p B&B. | G-L. | f Snead. | 1/2 F Tim | 4.60 | | |
| | | | | 4250p | 3950 | 138 | 32x4 1/2 | Roamer. 6-54-E | Cont. 12XD | 6-3 1/2 x 5 1/2 | 29.40 | Strom. | West. | Split. | s-p B&B. | G-L. | f Snead. | 1/2 F Tim | 4.60 | RL-R2 | |
| 3685 | 3485 | 3800 | 3650c | 4650p | | 128 | 32x4 1/2 | Roamer. 4-75-E | Roeh. | 4-4 1/2 x 6 28.90 | 28.90 | Strom. | West. | Split. | s-p B-L. | B-L. | f Snead. | 1/2 F Tim | 4.08 | RL-R2 | |
| 3785 | | | | | | | | | | | | | | | | | | | | | |
| | 895 | | 975 | 1175 | 1275 | 112 | 31x5 1/2 | Rollin | Own. | 4-3 1/2 x 4 1/2 | 16.90 | Tillotson | Dyneto. | Conn. | s-p B&B. | Muncie. | f Snead. | 1/2 F Sals | 5.10 | F2-F2 | |
| 11400 | 10900 | 11450 | | 12800 | 12850 | 143 1/2 | 33x5 | Rolla-Royce. 40-50 | Own. | 6-4 1/2 x 4 1/2 | 48.60 | Own. | Bijur. | Bosch. | e Own. | Own. | m Own. | F Own | 3.72 | RL-R2 | |
| | | | | 5100 | 5200 | 118 | 32x4 | Rubay | Own. | 4-2 3/4 x 5 1/2 | 12.10 | Strom. | Bosch. | Bosch. | s-p Own. | Own. | m Own. | F Own | 5.10 | F-R2 | |
| | | | | 5250 | | | | | | | | | | | | | | | | | |
| 1615 | 1615 | | 2015d | 2015 | 108 | 33x4 | Sayers Six. DP | Cont. 8 R | 6-3 3/4 x 4 1/2 | 27.34 | 27.34 | Strom. | Delco. | Delco. | s-p B&B. | G-L. | m Arvac. | 1/2 F St. 1 | 4.75 | RL-R2 | |
| 875 | 875 | | | | 108 | 30x3 1/2 | Seneca. L-2 & O-2 | Lye. KB | 6-3 1/2 x 5 1/2 | 19.60 | 19.60 | Zenith. | A-L. | A-L. | s-p B&B. | G-L. | m Univ. | F Peru | 4.75 | RL-R2 | |
| 985 | 985 | | | | 112 | 31x4 | Seneca. 50c & 51c | Lye. KB | 4-3 3/4 x 5 | 21.03 | 21.03 | Zenith. | A-L. | A-L. | s-p B&B. | G-L. | m Univ. | F Peru | 5.00 | RL-R2 | |
| 2750 | 2750 | 2750 | 2425g | 3585 | 3985 | 130 | 32x4 1/2 | Stanley. 740 | Own. | 2-4 x 5 | 13.00 | None. | Bijur. | None. | None. | None. | None. | None. | None. | None. | |
| 490 | 490 | | 640d | 785 | p835d | 102 | 30x3 1/2 | Star | Cont. Spec | 4-3 1/2 x 4 1/2 | 15.61 | Tillotson | A-L. | A-L. | s-p Own. | Warner. | m Spicer | 1/2 F Own | 1.50 | RL-R2 | |
| 1750c | 1750 | 1445g | e1995p | 2350 | d2195f | 125 | 34x4 1/2 | Stearns-Knight. SKL4 | Own. Kn't | 4-3 3/4 x 5 1/2 | 22.50 | Schebler. | West. | A-K. | m-d Own. | Own. | f Cli. | 1/2 F Own | 4.87 | RL-R2 | |
| 2395 | 2395 | 2495 | 3150p | 3395 | 3395 | 130 | 34x4 1/2 | Stearns-Knight. 6 | Own. Kn't | 6-3 3/4 x 5 | 27.34 | Schebler. | West. | A-K. | m-d Own. | Own. | f Cli. | 1/2 F Own | 4.70 | RL-R2 | |
| 1295 | 1295 | | 1595d | 1995 | 117 | 32x4 | Stephens. 10 | Own. | 6-3 1/4 x 4 1/2 | 25.35 | 25.35 | Strom. | Delco. | Delco. | s-p B&B. | Mech. | m Mech. | 1/2 F Tim | 5.10 | RL-T1 | |
| | 1750 | 1595 | 1850c | | 124 | 33x4 1/2 | Stephens. 20 | Own. | 6-3 1/4 x 4 | | | | | | | | | | | | |



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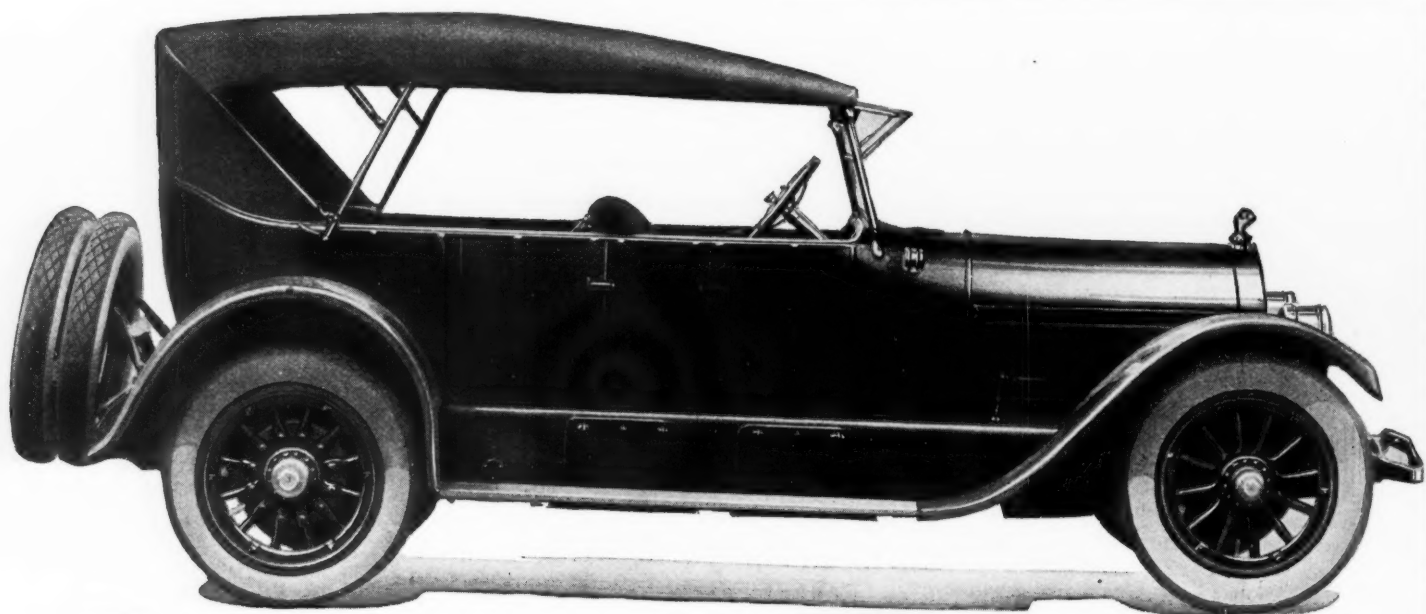
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1. Is the truck you are considering really national in reputation—is it nationally used, serviced, and recommended? (a)
2. How many trucks of the make you are considering are actually in use in America today? (b)
3. Can the truck be employed in all lines of business? (c)
4. Can the truck be worked under all traffic conditions regardless of regional variation? (d)
5. Is the truck made by a strong, experienced company? (e)
6. Has the truck been improved to keep pace with the latest developments in design and manufacture? (f)
7. Is the truck made in a full assortment of models to meet all markets? (g)

(a) The Improved Republic is one of the few truly national truck propositions available to the truck dealer today.

(b) The position of the Improved Republic is established more convincingly than any general claim can indicate. It is swiftly widening the Republic margin of leadership—and *more Republics are actually in use today than trucks made by any other exclusive truck maker.*

(c) The Republic is being used now in *every* line of business using trucks.

(d) The Republic is at work in every state of the Union as well as in many foreign countries, consistently overcoming all road handicaps.

(e) The Improved Republic is the creation of unexampled experience linked with dynamic administration and supported by ample capital.

(f) The Improved Republic exceeds every other former Republic model in its approach to perfection. And that's saying about all that can be said about a motor truck's reliability in power, endurance, and control.

(g) The Improved Republic is offered in a complete line of five units meeting the whole range of truck requirements.

REPUBLIC MOTOR TRUCK CO., INC., ALMA, MICHIGAN
More Trucks in Use than any other Exclusive Truck Builder

BUS LINES
USE THEM

HOISTERS
USE THEM

CATERERS
USE THEM

SAWMILLS
USE THEM

Trucks Chassis

A North American Association

—the model, all over the World

IT IS NOT a mere boast to say that the publications of the United States and Canada are the most progressive and farthest advanced of any country in the world.

Eight years ago—in co-operation with advertisers and advertising agents—the leading publishers assisted in organizing the association which places the buying of advertising space on a Basis of Certainty.

The Audit Bureau of Circulations has pioneered the way from old-fashioned, haphazard methods to the modern method of buying space with the publisher's books open to the advertiser. Through this work a remarkably efficient system for auditing publications has been built up and today is applied to practically all the leading newspapers, mag-

azines, farm papers, and trade papers of the United States and Canada.

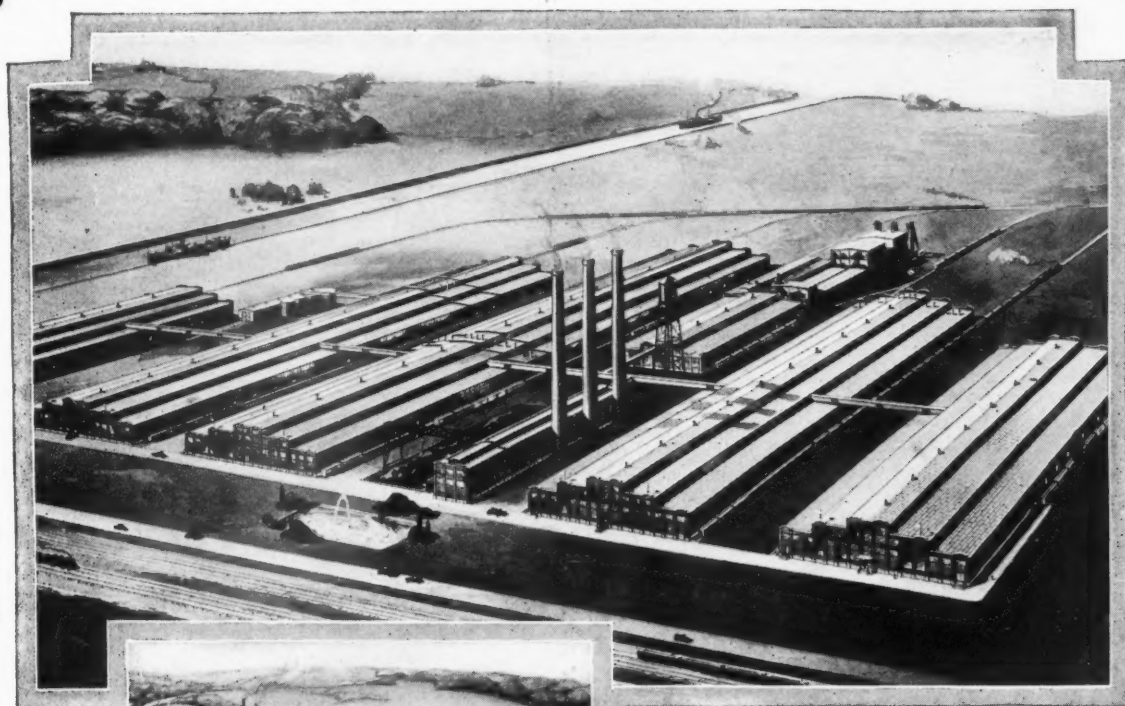
That this system is economically sound and fills a real need in business, is shown by the fact that other countries have patterned their associations after the A.B.C.

England, France and Holland have taken steps to build up Auditing Bureaus that will give the advertiser and the publisher the same opportunity to meet on common business ground that they have in America.

Publishers of this continent willingly co-operate with the A.B.C. because they believe that in furnishing audited circulation figures to the advertisers they are co-operating in a way that will be mutually helpful.

*MOTOR AGE is a member of the A.B.C.
and would be pleased to submit a
copy of the latest circulation report*

INVEST YOUR ADVERTISING DOLLARS BY USING A.B.C. REPORTS



The Johns-Manville plant at
Manville, N. J.

The new Johns-Manville plant at Waukegan, Ill. It covers 225 acres. There are over four miles of railroad sidings. This huge plant, together with the one at Manville, N. J., enable us to make prompt shipments to our distributors and dealers no matter where they are located.

ready!
for
1924

~ our big
new factory
demands a
big selling
plan

**Turn to the right
and read about it.**

Here's news for every garage and service station in the United States ~



Are you a small quantity buyer? Or large quantity? Whichever way you buy brake lining you are well taken care of under the Johns-Manville Sales Plan for 1924. Every dealer in the United States benefits by the attractive margins offered and all share the same fair price—made possible by our doubled plant capacity.

Get the details of this new Johns-Manville Plan from your distributor—listed on the back of the next page.



\$ 1,785,000,000 passed through the cash registers of shops like yours during 1923

Nearly two billion dollars, think of it, two billion! This figure represents service sales, including labor (not including gas, oil, or tires). That's the volume of the business you're in! This year service sales will be on a par with new car sales. At last the market has turned—turned in favor of your service station.



\$ 75,000,000 was spent on service supplies such as brake lining, clutch facings etc.

When you go after this part of your market you'll begin to think of Johns-Manville. Here we can help you do a big business—by supplying you with the best lining ever turned out in the quantities you need to show you a profitable turnover—prompt shipments from our local distributor's stock—and all the dealer helps you care to use.

Note—The figures given in this advertisement were taken from the records of the Research Department of the Chilton Company of Philadelphia.



\$ 225,000,000 was spent on accessories, such as speedometers, bumpers etc. ~

This is a tremendous market and can be increased at will by energetic dealers. Ask 'em to buy! You will find the Johns-Manville Speedometer for Ford cars very easy to sell on this basis. Every Ford owner knows he needs one and he requires very little persuasion when he sees this good-looking, efficient specialty. Ring the cash register!



These figures will increase during 1924
How much of this business will you get?

Large as these figures were for 1923, they are bound to be still greater during the present year. In the last five years the sale of parts and accessories has increased 88.7%. CAR MAINTENANCE is becoming the biggest division in the automotive field. That's your business and ours. We're going to make the most of it.

You'll need help ~

We're going to help you sell the idea of "car maintenance" to your customers. This attractive flange sign, shown on the right, is one of the ways we help get business into your shop. We will also be glad to send you booklets, newspaper advertisements, window cards, etc. Keep your trade constantly reminded that you're in business to keep their cars running over the road.

Ask your distributor's salesman for a complete lineup of the Johns-Manville Plan. The Johns-Manville Distributors are listed on the next page.



CHOOSE YOUR DISTRIBUTOR

Alabama
Moore-Handley Hardware Co., Birmingham
Johnson Tire & Auto Co., Montgomery

Arkansas
Crow-Burlingame Co., Little Rock

California
Chanslor & Lyon Co., Fresno
The Banta Company, Los Angeles
Chanslor & Lyon Co., Los Angeles
Featherstone, E. A., Los Angeles
McCoy Motor Supply Co., Los Angeles
Chanslor & Lyon Co., Oakland
Winstock-Nichols Co., Oakland
Kimball-Upson Co., Sacramento
P. W. Gavin Company, San Diego
Chanslor & Lyon Co., San Francisco
McCoy Motor Supply Co., San Francisco
Winstock-Nichols Co., San Francisco
California Auto Supply Co., Stockton

Colorado
Auto Equipment Co., Denver
Foster Auto Supply Co., Denver
Motor Accessories & Tire Co., Pueblo

Connecticut
Hessel & Hoppen Co., New Haven
Motor Tire Service Co., Putnam

District of Columbia
National Electrical Supply Co., Rubel, Chas., & Co.

Florida
Baughman Company, G. Norman, Jacksonville
Baughman Company, G. Norman, Miami
Baughman Company, G. Norman, Tampa

Georgia
Alexander-Seewald Co., Atlanta
Ozburn-Abston Co., Atlanta

Illinois
Automobile Supply Co., Chicago
Chicago Automobile Supply House, Chicago
Motor Car Supply Co., Chicago
Sheridan Auto Supply Co., Chicago
Tenk Hardware Co., Quincy
Washington Auto Supply Co., Washington

Indiana
Orr Iron Co., Evansville
Lomont & Co., Fort Wayne
The I. J. Cooper Rubber Co., Indianapolis
Goodlin Auto Equip. Co., South Bend

Iowa
Cedar Rapids Auto Supply Co., Cedar Rapids
Sleg Co., Davenport
Herring Motor Co., Des Moines
Repas Auto Co., Waterloo

Kansas
The Frank Coladay Hardware Co., Hutchinson
The Weldon Motor Supply Co., Salina
Southwick Auto Supply Co., Topeka
The Massey Hardware Company, Wichita

Kentucky
Peaslee-Gaulbert Co., Louisville

Louisiana
Shuler Auto Supply Co., New Orleans
Interstate Electric Co., Shreveport

Maine
The Farrar-Brown Co., Inc., Portland

Maryland
Auto Supply Co., Baltimore
Coggins & Owens, Baltimore

Massachusetts
Linseott Supply Co., Boston
Motor Tire Service Co., Fitchburg
Duncan & Goodell Co., Worcester
Motor Tire Service Co., Worcester

Michigan
E. A. Bowman, Inc., Detroit
Tisch Auto Supply Co., Grand Rapids

Minnesota
Kelley-Duluth Co., Duluth
Minneapolis Iron Store Co., Minneapolis
Reinhard Bros. Co., Minneapolis
Williams Hardware Co., Minneapolis
Nicols, Dean & Gregg, St. Paul

Missouri
Joplin Supply Co., Joplin
The Faeth Company, Kansas City

Missouri (cont'd)
Ayers Farmer Auto Supply Co., St. Joseph
Beck & Corbitt Iron Co., St. Louis
Fred Campbell Auto Supply Co., St. Louis
Geller, Ward & Hasner, St. Louis
Hermann-Sanford Company, Springfield

Montana
Northwestern Auto Supply Co., Billings

Nebraska
Nebraska Bulck Auto Co., Lincoln
Storz-Western Auto Supply Co., Omaha

Nevada
Nevada Auto Supply Co., Reno

New Hampshire
Thompson & Hoague Company, Concord

New Jersey
Economy Auto Supply Co., Newark
Pruden Hardware Co., Newark

New York
Albany Hardware & Iron Co., Albany
Martin-Evans Co., Brooklyn
H. D. Taylor Co., Buffalo
Barker, Rose & Clinton Co., Elmira
Weaver-Ebling Automobile Co., New York City
Pruden Hardware Co., W. E., New York City
Whittemore-Sim Co., Inc., New York City
The Olmsted Co., Inc., Syracuse

North Carolina
Carollnas Auto Supply House, Charlotte
Ko-Mo Supply Co., Charlotte
Automobile Supply Co., Wilmington

North Dakota
Grant-Dadey Company, Fargo

Ohio
The Penn. Rubber & Supply Co., Akron
C. & D. Auto Supply Co., Cincinnati
The I. J. Cooper Rubber Co., Cincinnati
The Penn. Rubber & Supply Co., Cincinnati
The Penn. Rubber & Supply Co., Cleveland
The I. J. Cooper Rubber Co., Columbus
The Penn. Rubber & Supply Co., Columbus
The I. J. Cooper Rubber Co., Dayton
The Penn. Rubber & Supply Co., Toledo
The Penn. Rubber & Supply Co., Youngstown

Oklahoma
Severin Tire & Supply Co., Oklahoma City
Severin & Company, Tulsa
Macaltery & Supply Co., Tulsa

Oregon
Wiggins Company, Inc., Portland
Chanslor & Lyon Co., Portland

Pennsylvania
Motor Accessories Co., Allentown
Central Supply Co., Altoona
The Penn. Rubber & Supply Co., Erie
Front Market Motor Supply Co., Harrisburg
General Auto Supply Co., Harrisburg
Johnstown Auto Co., Johnstown
General Auto Supply Co., Lancaster
The Penn. Rubber & Supply Co., Oil City
Herrodin Auto Supply Co., Philadelphia
Gaul, Derr & Shearer Co., Philadelphia
Roberts Electric Supply Co., H. C. Philadelphia

Pittsburgh
Dyke Motor Supply Co., Pittsburgh
Jackson Motor Supply Co., Pittsburgh
General Auto Supply Co., York

Rhode Island
Belcher & Loomis Hardware Co., Providence

South Carolina
Franke Co., Inc., C. D., Charleston
D. W. Alderman, Jr., Inc., Florence
D. W. Alderman, Jr., Inc., Greenville

South Dakota
L. & L. Motor Supply Co., Sioux Falls

Tennessee
Southern Auto Supply Co., Chattanooga
The I. J. Cooper Rubber Co., Knoxville
Ozburn-Abston & Co., Memphis
Auto Supply Co., Nashville
The I. J. Cooper Rubber Co., Nashville

Texas
Ferris-Dunlap Co., Dallas
Tri-State Motor Company, Inc., El Paso

Texas (cont'd)
The Equipment Co. of Texas, Fort Worth
Meyer Co., Jos. F., Houston
The Southern Equipment Co., San Antonio
McCauley-Ward Motor Supply Co., Waco

Utah
Inter-Mountain Electric Co., Salt Lake City
Motor Mercantile Co., Salt Lake City

Vermont
Vermont Hardware Co., Burlington

Virginia
The Owens-Merritt Co., Danville
Piedmont Hardware Co., Danville
Crump Co., Benj. T., Richmond
Talmán Auto Supply Co., Richmond
Meadows-Price Co., Roanoke

Washington
Chanslor & Lyon Co., Seattle
Reynolds & Reynolds, Seattle
Chanslor & Lyon Co., Spokane
Holley-Mason Hardware Co., Spokane
Chanslor & Lyon Co., Tacoma
Reynolds & Reynolds, Tacoma

West Virginia
Williams Hardware Co., Clarksburg

Wisconsin
Clemons Auto Supply Co., Eau Claire
Andrue & Sons Co., Julius, Milwaukee
Shadbolt & Boyd Iron Co., Milwaukee
Tisch Auto Supply Co., Milwaukee
Western Motor Supply Co., Milwaukee

Wyoming
Auto Equipment Co., Casper

CANADA

Alberta
The Motor Car Supply Co. of Canada, Ltd., Calgary
The Motor Car Supply Co. of Canada, Ltd., Edmonton

British Columbia
Marshall-Wellis, B. C., Ltd., Vancouver

Manitoba
Wood, Vallance, Ltd., Winnipeg

New Brunswick
The Lounsbury Company, Ltd., Newcastle

New Scotia
J. J. Snook Ltd., Truro

Ontario
The Nicholson Sales & Service Corp., Ltd., Hamilton
A. Chown & Co., Ltd., Kingston
Just Motors Limited, Ottawa
Johnson-Dean Ltd., Toronto
Samuel Trees & Co., Ltd., Toronto
Bowman-Anthony Co., Windsor

Saskatchewan
Wood, Vallance, Limited, Regina

FOREIGN

Australia
Duncan & Co., Melbourne
Cornell, Ltd., Adelaide
Chas. Atkins & Co., Ltd., Perth
Canada Cycle & Motor Agency, Brisbane

Great Britain and Ireland
Hislop, Lloyd & Co., Sydney

Japan and Korea
A. C. R. Greene & Co., Ltd., London
Takemura Company, Yokohama

Mexico
Mexico Auto Supply Co., Mexico City

New South Wales
Hislop, Lloyd & Co., Sydney

New Zealand
Jas. J. Niven & Co., Ltd., Wellington

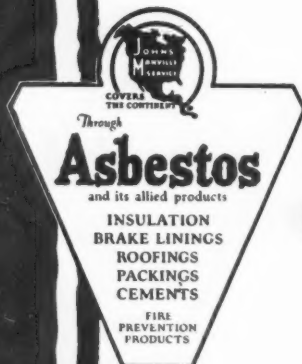
Norway, Sweden and Denmark
F. Bulow & Co., Copenhagen

Panama
The Torbert Wholesale Rubber & Accessory Co., Panama City

Spain
Luis R. Villamil, Madrid

Union of South Africa
Bartle & Co., Ltd., Johannesburg

Uruguay
Clericetti & Barrella, Montevideo



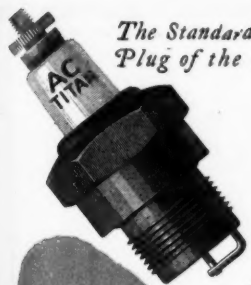
JOHNS-MANVILLE

Automotive Equipment

JOHNS-MANVILLE Inc., 296 Madison Avenue at 41st Street, New York City

Branches in 61 Large Cities

For Canada: CANADIAN JOHNS-MANVILLE CO., Ltd., Toronto



*The Standard Spark
Plug of the World*

More than 85 per cent of all cars and trucks produced in this country, Fords excluded, are factory equipped with AC Spark Plugs. Among these cars are:

| | |
|----------------|------------|
| Buick | Hupmobile |
| Cadillac | Jewett |
| Chalmers | Jordan |
| Chandler | LaFayette |
| Chevrolet | Marmon |
| Chrysler Six | Maxwell |
| Cleveland | Nash |
| Dodge Brothers | Oakland |
| Dort | Oldsmobile |
| Durant | Paige |
| Essex | Star |
| Hudson | Yellow Cab |

This tremendous, ready-made market for AC's is right at your door and will always be there in ever increasing size.

Car owners know AC's reputation as a spark plug maker because AC Spark Plugs year after year have demonstrated AC superiority.

The AC line is a safe investment because the market for it is assured by its factory equipment business.

The carbon-proof feature of the AC 1075 makes it a better plug for Ford engines.

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915. U. S. Pat. No. 1,216,139, Feb. 13, 1917
Other Patents Pending

SPARK PLUGS SPEEDOMETERS



*The accurate, easily in-
stalled AC Speedometer can
be sold to every Ford owner*

Your Line Is Not Complete Without Fisk Red-Tops

Always a Constant Universal Demand
for this One Tire that has no Substitute

No matter how large or varied your stock may be—you are losing business that we have created for you through extensive advertising in your community—if you don't carry Red-Tops.

No tire offered today has more permanent and faithful following. Years of experience has proved to Red-Top users the unequalled economy, service and distinction this famous Fisk Tire offers. And naturally they will accept no substitute.

Experience shows you must have Red-Tops to satisfy this insistent demand. Red-Top profits go to the Red-Top dealers.

There's a Fisk Tire of extra value for every car, truck or speed wagon

THE FISK TIRE COMPANY, Inc.
Chicopee Falls, Mass.

Extra Ply of Fabric—Extra Heavy Tread



Trade Mark Reg. U.S. Pat. Off.
Time to Re-tire?
(Buy Fisk)

THE success of the Durant and the new Star car at the New York Auto Show vividly demonstrates the progressiveness of the Durant organization. Every Durant product is modern to the minute. Can you afford to sell any other kind? Your territory may be open—write the nearest factory.

DURANT MOTORS, Inc.

Elizabeth, N. J.

Lansing, Mich.

Oakland, Calif.

Leaside, Ontario, Canada



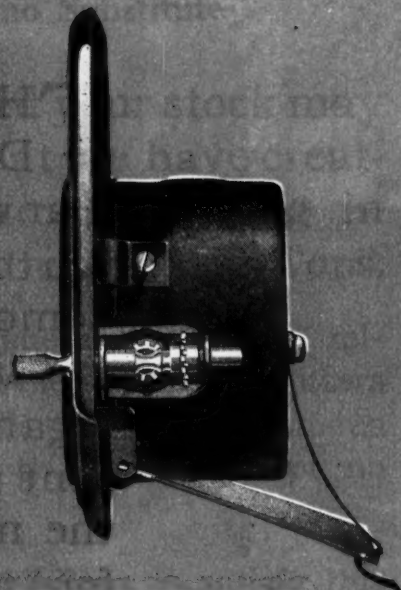
Just a real good opportunity

A Big New Feature Speedometer for



\$15
(Western Price
\$15.50)

- ADD OIL TO MOTOR—Keep level between crank case petcocks. Use light high grade oil.
- OIL—Fill oil cups. Give special attention to commutator.
- GREASE—Fill all grease cups including cup on speedometer swivel joint. Note—To lubricate new style fan bearing, unscrew plug and use heavy fluid oil.
- OIL—Apply oil to all bearing surfaces not supplied with oil cups.
- GREASE—Fill all grease cups. Grease wheel bearings liberally.
- OIL—Drain oil from crank case, following directions in Ford manual.
- GREASE—Add grease to differential not more than one-third full.
- GREASE—Reduction gears in steering wheel.



The above view shows how the metal chart snaps up under the speedometer. It is entirely out of sight when not in use, yet always at hand.

Dealers!

Stewart national advertising in the Saturday Evening Post, Billboards, Newspapers and Country Gentleman, featuring this latest speedometer, will create a big demand that will be made even greater by nationwide anti-speeding campaigns. Stock up now!

STEWART-WARNER SPEEDOMETER CORPORATION - CHICAGO, U. S. A.

Stewart

CUSTOMBILT ACCESSORIES
USED ON 9 MILLION CARS

in the *Stewart* Ford Cars

Metal Plate with Lubrication Directions now attached to Speedometer

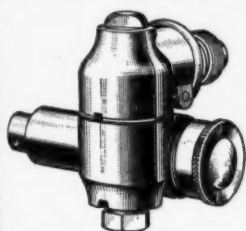
Colored numeral dials tell *when* to lubricate
Metal chart tells *where*

NO more burned out bearings—no more scored cylinders—no more parts to replace due to lack of oil and grease because the driver didn't know they needed attention.

A colored numeral turns up in the mileage odometer and automatically warns the driver that some part or parts should be lubricated. He pulls down the metal chart which tells him just what parts these are.

Correct lubrication will cut down running expenses and greatly lengthen the life of any car.

The colored numerals and metal chart are exclusive Stewart features.



The improved Stewart Swivel Joint does away with trouble due to rough road driving. Properly installed, the Stewart Speedometer will give perfect speed register and entire satisfaction.

Tell Ford owners "Watch your Speedometer"

DEALERS should tell every Ford owner how important it is that he has a speedometer.

In practically all states there is widespread agitation against speeding. The driver who knows his speed will save fines and avoid imprisonment.

Tell Ford car drivers they can't guess their speed. Ask them to try it in a car equipped with a speedometer. Then they will realize the importance of having a Stewart Speedometer in order to *know* their speed.

See the next issue of the Stewart Lever. It illustrates in detail how quick and easy a Stewart Speedometer can be installed.

STEWART-WARNER SPEEDOMETER CORPORATION - CHICAGO, U. S. A.

Stewart

CUSTOMBILT ACCESSORIES
USED ON 9 MILLION CARS

Through the eyes of Faith

Out of hundreds of letters from pastors and priests, let us quote only one:

PRODUCTS OF GENERAL MOTORS

BUICK
CADILLAC
CHEVROLET
OAKLAND
OLDSMOBILE
GMC TRUCKS

Delco and Remy Electrical Equipment • Fisher Bodies • Harrison Radiators • Jacox Steering Gears AC Spark Plugs—AC Speedometers • New Departure Ball Bearings Delco-Light and Power Plants and Frigidaire • Jaxon Rims Brown-Lipe-Chapin Differential Gears • Lancaster Steel Products Hyatt Roller Bearings • Inland Steering Wheels • Dayton Wright Special Bodies • Klaxon Horns.

General Motors cars and Delco-Light Products may be purchased on the GMAC Deferred Payment Plan. Insurance service is furnished by General Exchange Corporation.

"Two years ago I purchased a car, and began going into the country communities for preaching services. In a short time I found a community thickly settled with people who had been without any church or any of the ministries of the church for twenty-five years.

"Time after time the little car was brought into play, to take preacher, singer and teacher to the work. A church building was suggested. 'It can't be done,' was the frequent dis-

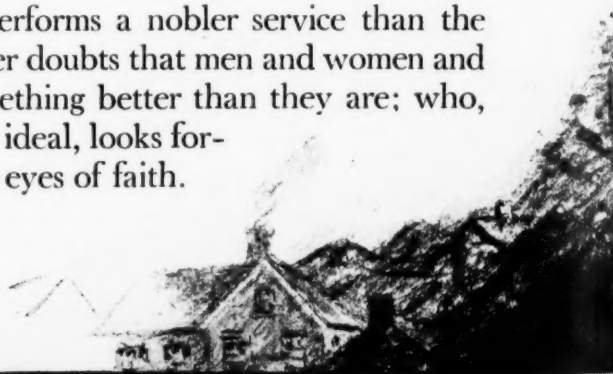
couraging remark. By trip after trip the interest was increased; construction began. Within two months the church was built, furnished completely, and paid for.

"Today the community is undergoing a marvellous change. The people remark about it. Merchants feel its influence. Young people are becoming interested in an education. Better literature is going into the homes. Without a car the whole program would have been impossible."

"The community is undergoing a wonderful change"—how many other simple, unobtrusive men have seen a similar change wrought as a result of their unselfish service!

A town is more than the sum total of the things which can be seen or counted or weighed; "where there is no vision the people perish," as truly as where there is no food.

And no man performs a nobler service than the minister, who never doubts that men and women and towns can be something better than they are; who, holding up a high ideal, looks forward through the eyes of faith.



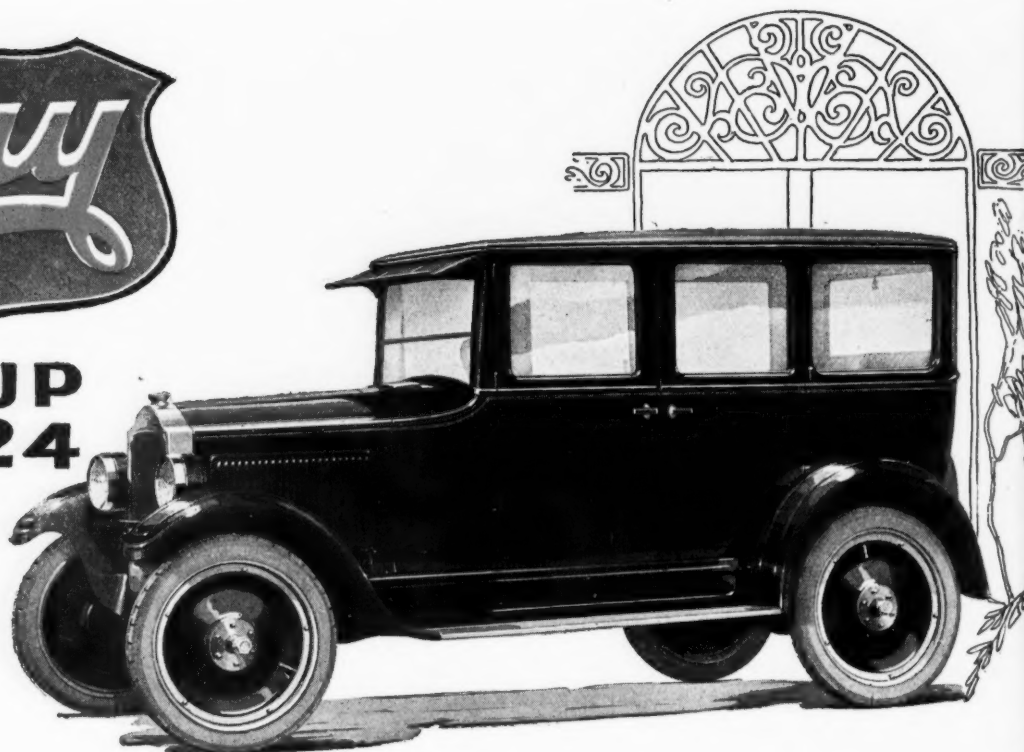
GENERAL



MOTORS



**GROUP
for 1924**



Latest Addition to the Gray Line

*Proven Economy and Dependability—
New Beauty and Increased Comfort—
Complete and Convenient Equipment—*

THESE are features which make the 1924 Gray Group the best in the light car field.

The new cars are characterized by the same economy of fuel consumption which won for Gray the world's official economy record—33.8 miles to the gallon of gasoline on a coast to coast run.

Mechanically, the new cars show many refinements. Radiator is increased in size and greatly improved in design. Vacuum feed is used and capacity of the gasoline tank is increased. The wheelbase is lengthened.

The well-known, low-speed, low-compression Gray engine, with its proven dependability and power remains the same. Eighteen years' experience in motor building is embodied in this power plant. Gray motors are known and accepted as the finest the world over.

Bodies on the 1924 Grays are outstanding examples of fine coach work, together with a beauty of design never before attained in their class. They are better looking, better built, guaranteed bodies, by one of the largest manufacturers and designed by the leading body engineers in the industry. Construction

is unusually rigid and durable with extra strainers under all quarters and panels. High-grade curled hair, overstuffed upholstery is used, with velour in the sedan and imitation leather in the other models. Many conveniences are included as standard equipment which ordinarily are extras.

Priced at from \$630 for the touring to \$875 for the sedan, the Gray Group for 1924 fills a place in the price scale which has heretofore been vacant. For the first time the public is offered a line of cars of the highest quality in every respect—mechanics, design, comfort, durability, convenience and economy of operation—at a price within the reach of every car buyer.

The one ton truck is another unit which has brought unheard of transportation records to Gray. It rounds out and completes the finest light car line.

DEALERS: Opportunities in the sale of this group are exceptional. Attractive franchises are still available and 1924 dealer discounts are the most liberal of any car within this range of prices. Make it a point to see the Gray Group at the Automobile Shows or write for catalog.

Study These Features:

Better looking, better built, guaranteed bodies—World's Official Economy Record—104" Wheelbase—Timken Axles and bearings—Larger Radiator—Vacuum Feed System—Fabric Universal—Demountable Rims—Straight Side Cord Tires—Gasoline Gauge.

Touring, \$630

Coupe, \$735

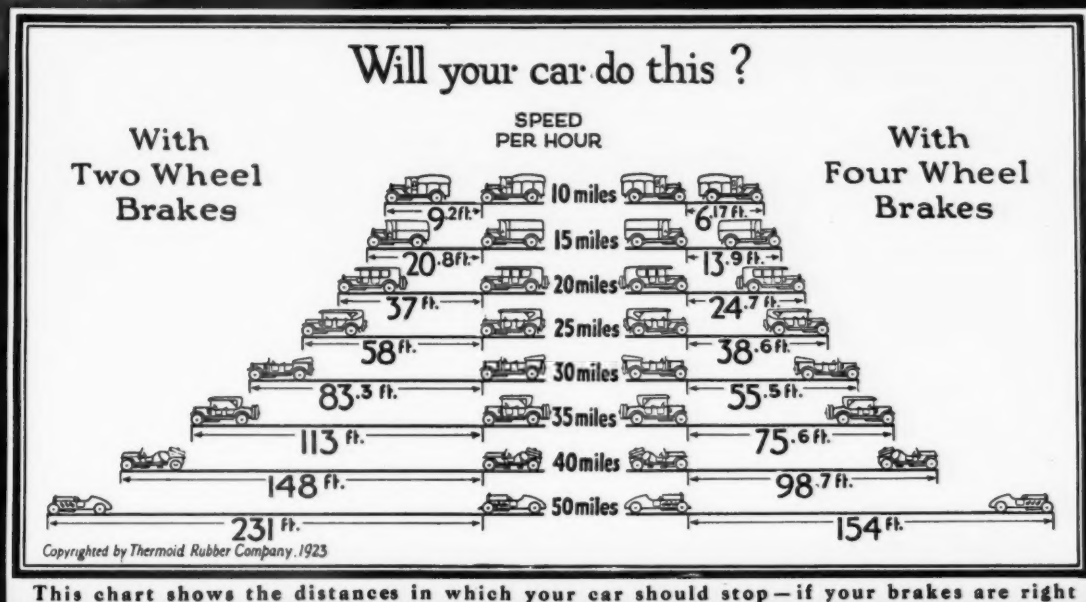
Sedan, \$875

Truck Chassis, \$575

All prices f. o. b. Detroit

GRAY MOTOR CORPORATION, DETROIT, MICHIGAN

We are selling
the Nation's Motorists
on the Idea



This chart shows the distances in which your car should stop — if your brakes are right

Have your brakes lined with

Thermoid
Hydraulic Compressed
Brake Lining



You get the jobs

Make yours a Thermoid shop and GET THE BUSINESS



WE ARE spending thousands and thousands on nationwide publicity. To advertise Thermoid? No. To advertise the repair shops that use Thermoid. To bring business to them.

Motorists don't buy brake-lining. They buy service from garages. We can't profit unless *you* profit first.

Our advertising has *one* message: "Look up the nearest Thermoid garage. Have your brakes inspected. Adjusted if need be. Lined with Thermoid when they need lining."

Make *your* shop that Thermoid shop. The motorists in *your* town are looking for it.

THERMOID RUBBER COMPANY, Trenton, N. J.

New York, Chicago, Los Angeles, Detroit, Atlanta, Seattle, Kansas City, Boston,
San Francisco, Cleveland, London, Paris, Turin

*Makers of Rexoid Transmission Lining, Thermoid Tires,
Thermoid-Hardy Universal Joints*

Thermoid Hydraulic Compressed Brake Lining



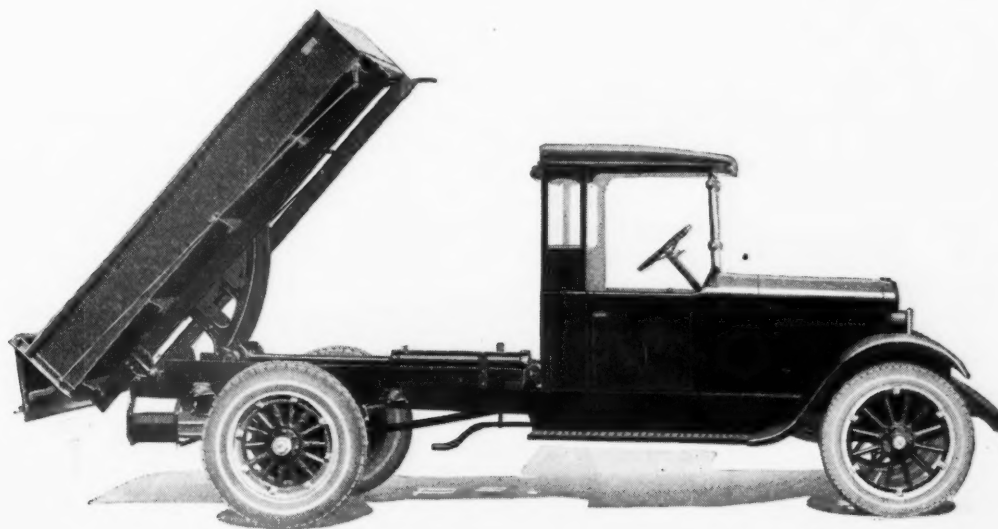
Assurance of Satisfaction

Graham Brothers trucks are powered by Dodge Brothers engines and sold by Dodge Brothers dealers—two facts of the utmost importance to users.

The engine assures the owner of ample power and dependable, low-cost performance. The scope and character of the dealer organization assures him of immediate service, no matter when or where it may be required.

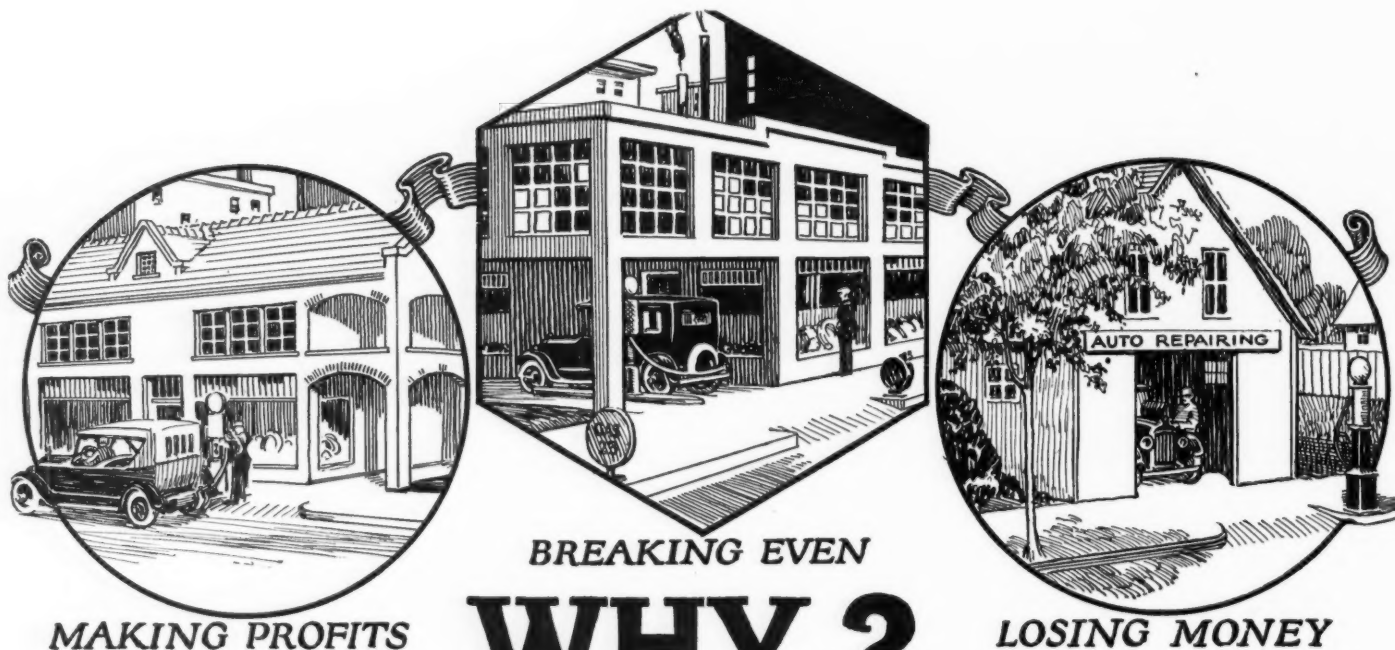
*1 Ton Chassis, \$1265; 1½ Ton, \$1325;
f. o. b. Detroit or Evansville, Ind.*

GRAHAM BROTHERS
Detroit



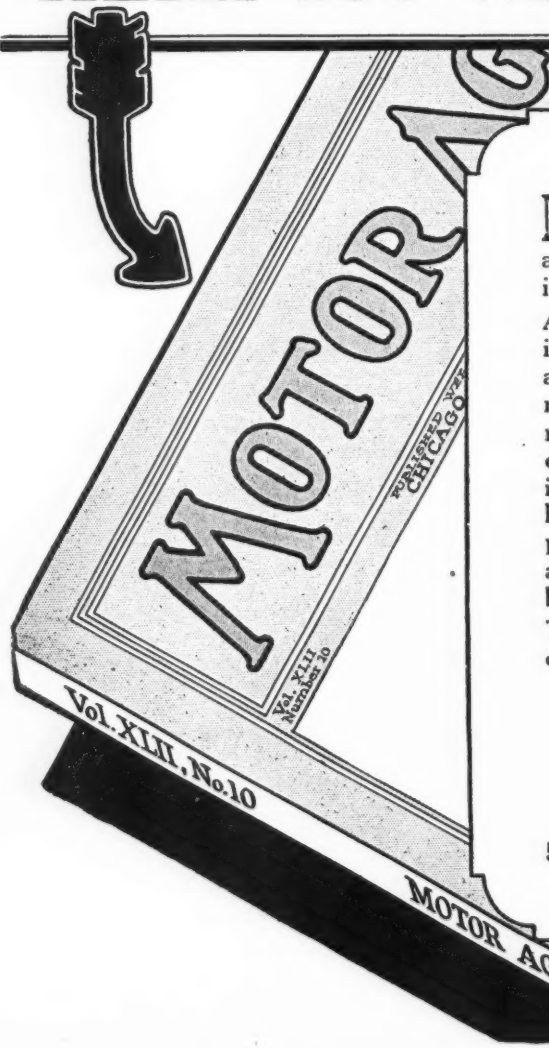
GRAHAM BROTHERS TRUCKS

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



WHY ?

HERE YOU WILL FIND THE REASONS



MOTOR AGE has set for itself a definite mission. It is a business paper of the automotive trade and concerns itself with the greater success of those in this tremendous field.

Among other important features, MOTOR AGE brings to its readers the fundamental reasons for success in the automotive trade. It tells why certain types of automotive merchants are successful and why others are not. It gets down to facts and specific reasons. It doesn't preach—it advises. As an influential factor in the progress of the automotive trade, MOTOR AGE has as one of its policies the belief that all of us can profit by the experiences of others. In every issue are found many valuable thoughts that were aroused by some dealer's experience.

Thousands of leading automotive dealers the world over are thus profiting by these weekly messages.

MOTOR AGE

5 SO. WABASH AVE.,

CHICAGO, ILL.

Chevrolet at the Shows

Money in merchandising is made easiest by selling what people want.

They surely do want Chevrolet.

Chevrolet now has 5 United States manufacturing plants, 7 assembly plants and 2 Canadian plants providing the largest production capacity in the world for high-grade cars, and yet public demand is steadily keeping ahead of us.

The continuous, aisle-blocking crowds at the Chevrolet show exhibits indicate the reason.

Chevrolet is *right*.

Our prices are *right*.

Our advertising is *thorough*.

Our dealer franchises are *profitable*.

Dealers like our *methods* and *policies*.

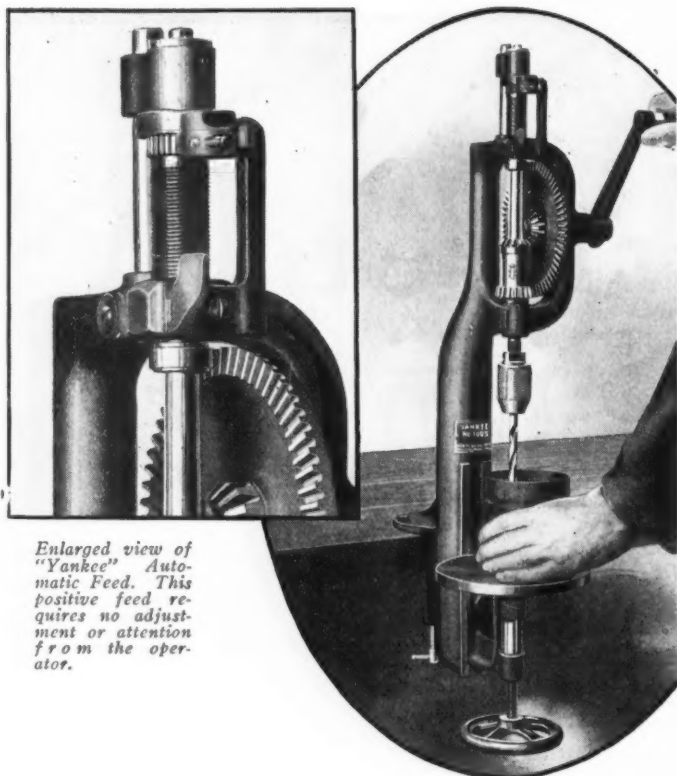
In any territory where we lack the very best representation, there is an opening for a merchandiser of economical transportation who can prove his qualifications.

Chevrolet Motor Company, Detroit, Mich.

Division of General Motors Corporation

for Economical Transportation





Enlarged view of "Yankee" Automatic Feed. This positive feed requires no adjustment or attention from the operator.

Good-Bye Hand-Feeding!

The "Yankee" Automatic Friction and Ratchet Feed regulates pressure for all drills from the smallest up.

Simply turn the crank and friction feed rapidly runs drill down to work. Ratchet feed then goes into operation and feeds at proper rate with right pressure. Automatic throw-off prevents jamming. With the

"YANKEE" Bench Drill

you can drill more rapidly, accurately and conveniently. You can't overfeed and drills are saved. Left hand free to hold work.

No. 1005 (illustrated) two speeds; 3-jaw chuck holds drills up to $\frac{1}{2}$ in. Entire length 28 in.

No. 1003 single speed; 3-jaw chuck holds drills up to $\frac{1}{4}$ in. Entire length 18 $\frac{3}{4}$ in.

Some other "Yankee" Tools

Ratchet Screw-drivers
Ratchet Hand Drills
Ratchet Breast Drills

Ratchet Tap Wrenches
Plain Screw-drivers, $1\frac{1}{2}$ to 30 in. blades

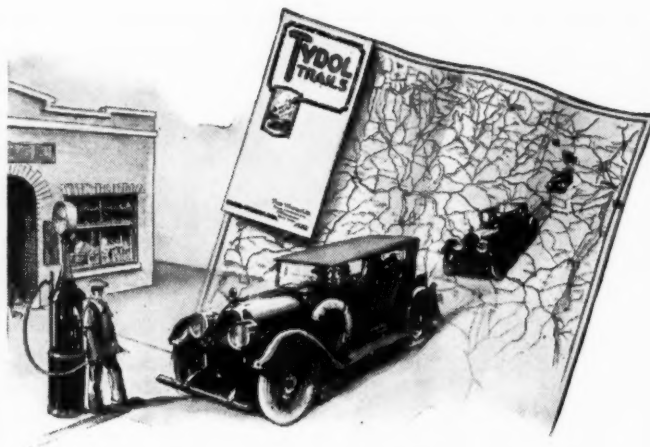
Tool Book Mailed Free

You will find all the "Yankee" Tools illustrated and described in this interesting and handy little book. Write for it.

Dealers everywhere
sell "Yankee" Tools.

NORTH BROS. MFG. CO.
Philadelphia, U. S. A.

"YANKEE" TOOLS
Make Better Mechanics



Keep them traveling
the right road—*your* road!

"How do I get to ———?"

Answer this inevitable question of the motorist in the most intelligent way—the way which is profitable to you.

Give him a road map showing *your* business establishments on the road he is to follow, enclosed in a folder which carries your selling message.

This is the RAND McNALLY Road Map advertising which is bringing good-will and profit to thousands of garages, service stations, automobile, tire and accessory manufacturers. It is advertising which the motorist will value and keep.

Let us prepare road maps for your various territories. The cost of this promptly productive type of advertising is surprisingly low even for maps in small quantities. *Blaze the trail of business to your door!*

Write for sample Advertising Road Maps. Let us explain in detail how profitable this advertising can be to you.

RAND McNALLY & COMPANY
Map Headquarters

Dept. A-53, 536 S. Clark Street, Chicago



AN OPEN LETTER



TO THE TRADE:

This company is dedicated, without reserve, to the manufacture of quality merchandise. The increase in business realized in 1923 over 1922 and the universal satisfaction our products have given are two reasons why this policy will remain in effect during 1924.

Every accessory that bears the name of "Kentucky Thoroughbred" is fabricated from the finest of all of America's natural resources. HONESTY.

Whether you see "Kentucky Thoroughbred" on a tire-pump, step-plate, steering wheel, tire carrier or other accessory, put your unreserved confidence in it, and I will back it up as I would my personal note.

For after all, our trade-mark and our promissory note are just the same in my eyes—a promise to deliver value for value received.

General Manager.

KENTUCKY PUMP MFG. CO.

224-226 West Franklin Street

EVANSVILLE,

INDIANA

PEDAL PADS for every make of car

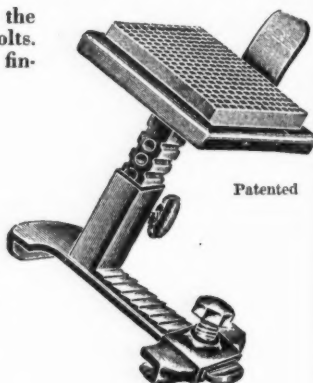
Attached in a jiffy—just bend the prongs. No drilling—no bolts. Best of material. Handsomely finished.

A stock so complete you can't miss a sale

Universal Extension Pedal

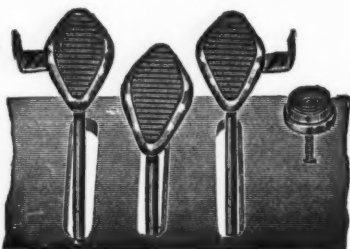
The pedal fits every shape or type of automobile brake and clutch. It is invaluable for cars driven by several people, as it adjusts quickly to suit the individual driver.

Price \$5.00 per pair.



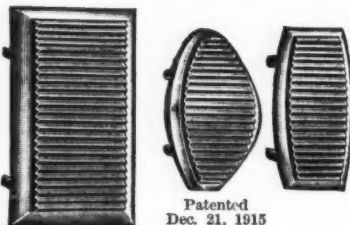
The New "D" Hook for Ford Cars

Provides a comfortable rest for the foot and relieves muscle tension. Attaches without bolt or drilling—just bend the prongs. A great convenience and a rapid seller in a big market. \$1.00 per set.



Pierce-Arrow—Cadillac—Ford

From the lowest priced car to the highest you can satisfy your customers instantly with "Perfection" Pedal Pads. No matter what the car is there's a "Perfection" Pedal Pad made for it.



New Accelerator Extension

Gives ease and comfort to driving. Brings the accelerator nearer the foot in ANY position. Prevents slipping. Rests the sole of the foot. Fits all cars and sells readily for \$2.00. A much needed utility.



This Display Board, Accelerator and Starter Pads, 12 assorted sizes, \$6.00

These pads are made in sizes to fit accelerator or starter for every make of car. Strong, well designed, heavy rubber pads set in a nickel frame. Makes control of the throttle easier and more certain. Price, 50c each.

Stock only twelve sizes, and you can equip any car that has been manufactured during this and the past SIX YEARS!



Manufactured by

AUTO PEDAL PAD COMPANY, Incorporated
318-320 West 52nd St. New York City

"PERFECTION" Pedal Pads

Insist on the pad with the Nickel Frame

HELP YOUR CUSTOMERS
TO FORGET THEIR CHAIN TROUBLES

HELP YOURSELF
TO MORE CUSTOMERS AND MORE PROFITS

By Installing Only

"WHITNEY" HIGH MILEAGE CHAINS FOR REPLACEMENTS

There are over 2,000,000 "Whitney" chains on the road today. Over 1,000,000 "Whitney" chains have been installed as original equipment on one well known make of car. Over 60,000 "Whitney" chains have been installed for replacements on the camshaft drive of one prominent motor although not used as original equipment on this car.

It is the GREATER MILEAGE that does it.

THE WHITNEY MFG. CO. HARTFORD, CONN.

New York
L. C. Biglow & Co.,
Inc.
243 West 55th St.

Boston
George C. Steil
724 Commonwealth
Ave.

Philadelphia
R. J. Howison
624 Race St.

San Francisco
A. H. Coates Co.
615 Howard St.

Seattle
A. H. Coates Co.
1115 E. Union St.

Selling trucks and buses is easier when you know the owner's viewpoint

Read *Motor Transport*.

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses. Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

Motor Transport is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy.

**Motor
Transport**
FORMERLY COMMERCIAL VEHICLE

(Published by the Class Journal Co.)

239 West 39th St. New York, N. Y.

Air for tires—Water—with one Outfit

Complete Service for Garages, Service Stations

You can attract many more passing motorists. And, when they stop, they usually buy.

Free Air, Running Water, and Comfort Station conveniences will bring these new customers to your garage or service station. It has been proved over and over again that this Service is the key to the motorist's trade.

A Milwaukee Air Power Water System makes it possible for you to give this complete service.

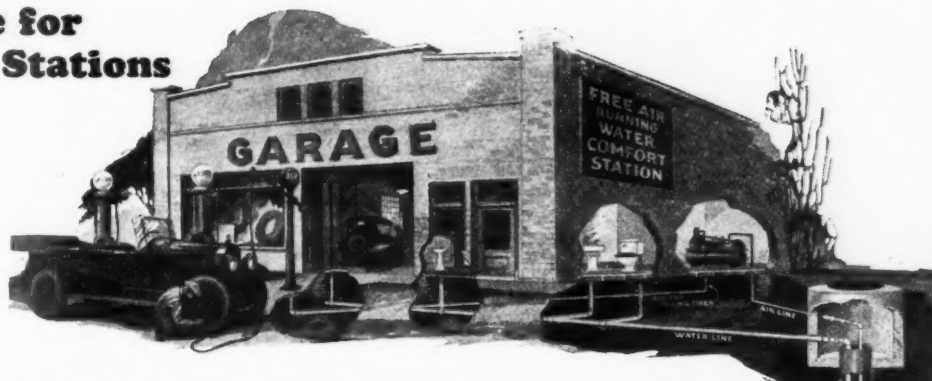
One outfit supplies both air for tires and water for all purposes. Or if you already have running water, the Milwaukee Air Compressor takes care of the air pressure for tires.

The Milwaukee Air Compressor will prove a revelation to you. With the ordinary air pressure outfit you may have found frequent trouble with leaking air valves. This is impossible with the "Milwaukee". The "Milwaukee" has the perfect packless globe valve. Holds air indefinitely. Cannot leak. Has no packing or stuffing nuts to work loose. The outfit is completely automatic. You determine the desired air pressure level and the "Milwaukee" maintains it.

Write for complete information about the Milwaukee Air Power Water System and the Milwaukee Air Compressor for garages and service stations.

MILWAUKEE AIR POWER PUMP CO.
51 KEEFE AVENUE MILWAUKEE, WIS.

*Largest exclusive manufacturers of
Air Power Pump equipment*

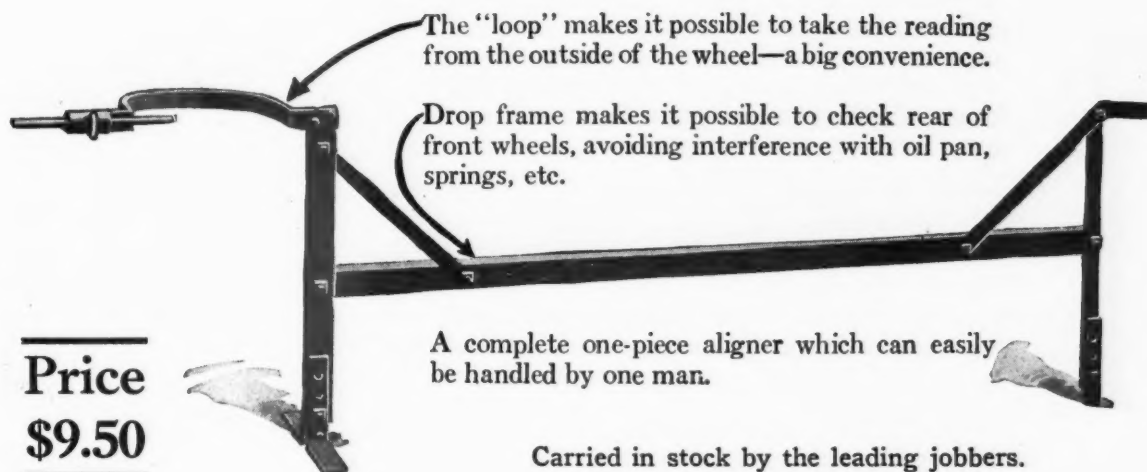


This shows the Milwaukee Air Power Water System installation. The compact outfit goes in a corner of the garage. One air line leads from the compressed air tank to the air power pump in the well. Another leads to the tire filling line. The water comes direct from the well to fixtures—water for all purposes. If desired, with additional pumps you can tap other sources. No water storage tank to freeze in winter or foul in summer. Equipment is simple, dependable, very economical.



Get a Manley

WHEEL ALIGNING GAUGE



The "loop" makes it possible to take the reading from the outside of the wheel—a big convenience.

Drop frame makes it possible to check rear of front wheels, avoiding interference with oil pan, springs, etc.

A complete one-piece aligner which can easily be handled by one man.

Price
\$9.50

Carried in stock by the leading jobbers.

For special bulletin write to

MANLEY MFG. CO., York, Pa.

Smoothing Out the Highways

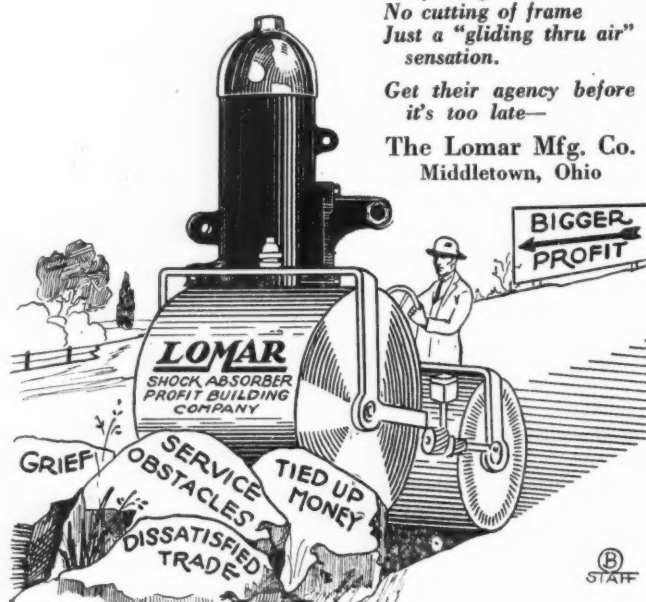
There is an enormous market for shock absorbers with big money in their sale, provided the ones you sell require no profit eating "after sale" servicing for dissatisfied customers.

Let us send you Lomar literature showing their construction, and simplicity.

No side sway
No jarring
No cutting of frame
Just a "gliding thru air" sensation.

Get their agency before
it's too late—

The Lomar Mfg. Co.
Middletown, Ohio



Most Complete Line
Manufactured in the
United States

Dependable
Reamers

SPIRAL FLUTE

TWIST DRILL

TAP

SPECIAL TOOLS FOR EVERY MAKE UP CAR

Moore & Moore, Inc.
Reading, Pa.

Engineers and Dealers

Be sure and see our exhibit at the Chicago

AUTOMOBILE SHOW

After 15 years of experimenting I have succeeded in inventing my latest Giant Oil and Air Shock Absorber.

This works on a rotary system and is attached lengthwise on the frame and the shock rod is attached to the axle. It is in a class by itself—The Best in the World. In general merits it is at least 100% ahead of my famous device which has been on the market for a number of years and which many thousands of auto owners now enjoy.

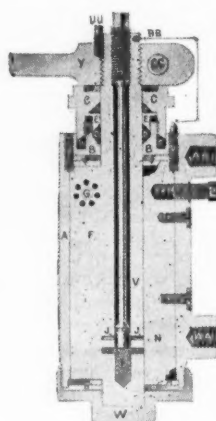
30 DAYS FREE TRIAL or
longer if desired.

GUARANTEED FOR 5 YEARS

As to our financial standing and reliability we refer you to Dun's or Bradstreet's.

We would be glad to send you our detailed illustrations and you see at a glance the correctness of our statements.

We are showing working models of both devices at the Chicago Automobile Show, Coliseum and First Regiment Armory, January 26 to February 2, 1924. Space 64.



ERNST FLENTJE

1643 Cambridge St., Cambridge, Mass.

Telephone University 0950

Branch 1887 Atlantic Ave., Brooklyn, N. Y.
Tel. Haddingway 2373.

Freezing
will not
spring
an
ATLAS

The Atlas Radiator has a big feature that will bring you sales this winter. It is burst-proof. The special brass honeycomb core is constructed to expand with freezing water and will not become distorted or sprung.

It has a greater cooling area and greater water capacity and is interchangeable with the standard Ford shell.

Write for details on the "Radiator with the Backbone" Made of Brass.

Made by

The Steidle Mfg. Co., Cincinnati, Ohio

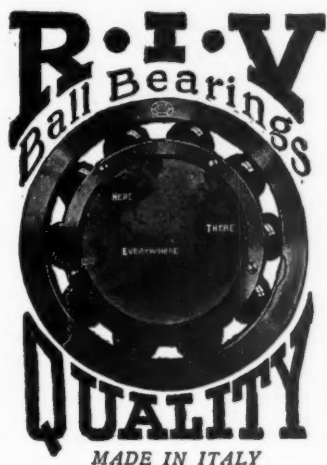
Exclusive Foreign
Distributors

The
A. C. Vanderpoel Co., Inc.
11 Moore St., New York City



ATLAS

RADIATORS
FOR FORDS



"THE BEST MONEY-MAKER IN THE BUSINESS"

A PARTS distributor in New York, whose ball-bearing account is perhaps the most valuable anywhere in the United States, said in our office December 5th.

"The R. I. V. is the best money-maker of all the ball-bearing propositions ever presented to us in the many years we have been in the replacement parts business."

In localities in which we are not already represented, we have real opportunities for concerns which do a fair volume of ball-bearing business. We are creating new distributors every week.

YOU may be the man we are looking for in your territory.

Why not write and ask us to show you how to get in on a big, permanently profitable, growing business?

Write on your business letter-head.

1755 Broadway  New York City

THERE IS BIG MONEY IN STORMIZING

"STORMIZING — the better method of cylinder reconditioning" is the secret of the success of many repair shops and garages.

The thorough, accurate work performed and the short time required gives the Storm equipped shop a prestige and reputation that brings new business to its doors.



STORM EQUIPMENT

For All Cylinder Work

From the lighter worn jobs requiring only Honing to the complete renewing of badly worn or scored cylinders, STORM equipment performs efficient service. The automatic operation of STORMIZING machines save valuable hours of the mechanic's time, leaving him free to work on other jobs.

Let us give you full information. Your request brings the STORM book: Modern Cylinder Methods.

STORM MFG CO

406 A Sixth Ave. So., Minneapolis, Minn.



No. 25 Warning Lamp

Does not command to stop — but gives a friendly warning — a courtesy to the approaching driver.

The Warning Hand



A new PARKING — TRAFFIC — COURTESY — WARNING LAMP, combined in one and known as the VICTOR No. 25 "SENTINEL."

Drum shaped and made of zinc with nickel finish. The lenses are 3 1/2" in diameter — made of pebbled glass with lifelike hand molded on the surface. The front lens is white frosted and floods the side of the car with light to show the driver's hand signal and as a courtesy to a passing driver. The rear lens, or warning lens, is ruby red.

A double filament bulb is provided. The major filament furnishes the warning and courtesy feature and the minor filament provides a good parking light.

Special Victor switches for the brake pedal and instrument board with each lamp.

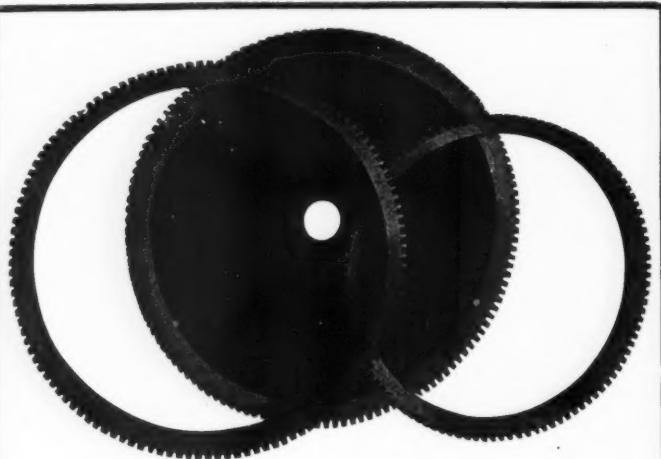
Built to VICTOR standards, of quality and workmanship.

Priced to every car owner's advantage and discounted to you for profit.

THE CINCINNATI VICTOR CO.

714 Reading Road

Cincinnati, Ohio



New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.
Ring Dept. Syracuse, N. Y.



NO REBORING

is Necessary With

GENUINE APEX INNERINGS (INSIDE PISTON RINGS)

Garagemen, mechanics and carowners have found no device so successful to

STOP PISTON SLAP

and oil pumping, excessive carbon, vibration, fouled plugs and to renew power, silence and flexibility. Best of all there follows a marked saving in gas and oil.

"Resales" can be quickly and economically repowered to greatly increased value.

**RETAIL
PRICE
20c**

each up to $\frac{3}{4}$ " wide
or 5" diam. Larger
35c. Insist on our
Guarantee Tag.

No Cutting or Fitting

to add expense to the job. Genuine Apex Innerings come ready cut and shaped in all standard and "over" sizes.

Dealers—Jobbers

Write us now. Others are getting big sales and a quick turnover.

THOMSON MFG. CO.
Peoria Dept. C Illinois
(Successors to Thomson-Friedlob Mfg. Co.)

IN CLEVELAND— IT'S THE HOLLENDEN

Not Expensive

ROOMS—

Large comfortable and well-furnished:

83 Rooms, hot and cold running water, \$2.50
210 Rooms, single with bath, \$3.00 - \$3.50
192 Rooms, with bath, \$4.00
160 Rooms, double, with bath, \$5.00 - \$6.00
135 Rooms, large double with bath, \$6.00 - \$7.00
Many Sample Rooms and Parlor Suites, \$7.00 up

BREAKFASTS—Club Breakfasts with generous portions at 65c, 75c and \$1.00.

LUNCHEONS—A la Carte in four nationally famous restaurants.

DINNERS—A la Carte. Special Sunday table d'hôte dinner at \$2.00.

CAFETERIA—Hollenden Cooking and Service at Cafeteria prices.

DANCING—Dinner Dancing with Carl Rupp's Hollenden Dance Orchestra every evening excepting Sunday. No Cover Charge.

ROSCOE J. TOMPKINS
Manager



HYDROMETERS

Do Not Wear Out
They Break

"Break-Not"
Storage Battery Testers

ALL THAT
THE NAME IMPLIES

The MOST WIDELY ADVERTISED
BATTERY TESTER in the WORLD

Its many patented features guarantee a Battery Tester of rare reliability.

Drop it on the floor—it will not break.

It is cushioned between the patented rubber housing and the bulb.

The three-colored float can be easily read—even at a distance.

SHOW THE "BREAK-NOT"

SELL THE "BREAK-NOT"


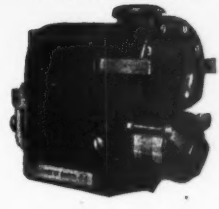
MAKE A BIGGER PROFIT

E. EDELMANN & CO.
Chicago, U.S.A.

Price
\$1.00

and Worth it
EAST OF ROCKY MOUNTAINS

Glance Look For
"The Name"
ROBERT BOSCH
and this
TRADE MARK

Over 3,000,000
Robert Bosch
Magnetos in Use

Type ZU4

We Work For and With You

in developing local sales.

Ask for details of the

Robert Bosch

Selling Franchise

Write or wire.

Robert Bosch Magneto Co., Inc.
Otto Heins, President

123 West 64th Street New York
Chicago Branch: 1302 South Wabash Ave.
Service Stations in Principal Cities the World Over
The Genuine, Original Bosch means
Robert Bosch only.



\$5.00 List Price

Pat. Pending **SECURITY**

You can see by the construction of Detroit Tire Lock how difficult it would be for anyone to remove a tire without first unlocking it. This lock becomes actually a part of the carrier itself. It cannot be broken or bent.

The lock unit is of the Yale or Corbin type—consequently cannot be picked.

*Territories are being closed up.
Write or wire for proposition.*

DETROIT CARRIER & MFG. CO.
DETROIT, MICH.

Detroit Tire Lock

Aluminite Pistons

Wear five times longer than die-cast pistons. They will not score, pump oil or slap. These Ribs carry heat away and prevent preignition. In use in 90 per cent of the successful racing motors. Weigh only one-third that of cast iron. Make a good four perform like a six. The result of nine years of successful operation. Used by winner of Pikes Peak Race. A combination of right alloy and right design. The one great replacement for all makes of cars. We also make Aluminite connecting rods. Special prices.



High Speed Camshafts

Replacement for all makes of cars. Permit higher speeds and give any motor more power. Tests prove this. A quality replacement at a low price. Replacement list, prices and discounts sent on request.



GREEN
ENGINEERING CO.
DAYTON, OHIO



WORKS BOTH WAYS

The hydraulic principle takes up the road shocks—controlling the spring action both ways—up or down.

Hydraulic Spring Control provides spring action similar to the effect of a man diving into the water—his body displaces his weight through the opposing force of the water.

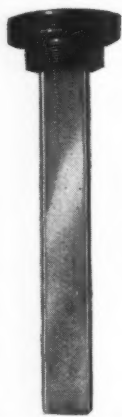
This principle controls the springs—it does not prevent their action. The greater the shock—the greater the opposing hydraulic force. A smooth even force that absorbs all shock.

Easy to install, long life (all working parts in oil), an unusual record of service, make the 2-Way Shock Absorber an exceptional proposition for live dealers.

Write for full details.

2WAY
HYDRAULIC
SHOCK
ABSORBERS

AUTO SPRING CONTROL CO.
Jamestown, New York



A Gas Gauge for CHEVROLETS

\$1.25

Another "TASCO" Gas Gauge for Chevrolet cars. Just screw in in place of regular gas cap in tank. Strong — lasting — efficient — unfailing registry. Best little gauge ever put out. Quick selling price — a REAL utility. At all good jobbers or write direct.

The Akron Selle Co.
Akron, Ohio

There's a GILLIAM Bearing for practically every application and every location in every make of automotive equipment.

Cups Cones Rollers
Alloy Steel Throughout



THE GILLIAM MFG. CO.

Canton, Ohio

MORE GOOD CUSTOMERS!



BOYLE VALVES BRING THEM

Once you have installed a set of Boyle Valves in a customer's car, you may be sure that he will always patronize you. These valves never fail to satisfy. They are guaranteed! They run from 50,000 to 100,000 miles without grinding! They operate silently!

BOYLE Never Grind VALVE

Write for our interesting proposition to jobbers, dealers and repair men. See how easily YOU can get more customers and larger profits.

BOYLE VALVE CO.

2101 Larrabee Street
Chicago



Diogenes

Diogenes, a Greek Philosopher, used to walk the streets of Athens 2300 years ago with a lantern in his hand.

On inquiry as to what he was looking for he used to say, "I'm looking for an honest man."

Through the ages his remark has been used as an example of humor and pessimistic futility.

Were he alive today he'd find his honest man in the old Anchor Bulb-maker.

And with an Anchor Bulb other honest men, which his old lantern missed, would be revealed to him. For buyers who are groping in the dark for an honest light at a low price we recommend.

ANCHOR

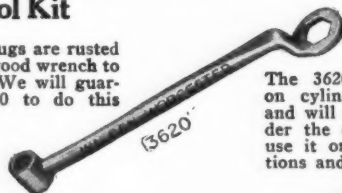
AUTO BULBS

"Triple-Tested" "Never Bested"

Anchor Electric Company
553 West Jackson Blvd., Chicago, Ill.

Every Ford Owner Needs This Wrench In His Tool Kit

When spark plugs are rusted in, it takes a good wrench to remove them. We will guarantee our 3620 to do this trick.



The 3620 can be used on cylinder head bolts and will get the two under the dash. You can use it on water connections and other parts.

Show this number 3620 to every Ford owner, it will make sales, show you a good profit and be a fast seller.

WALDEN-WORCESTER
Incorporated
WORCESTER, MASSACHUSETTS

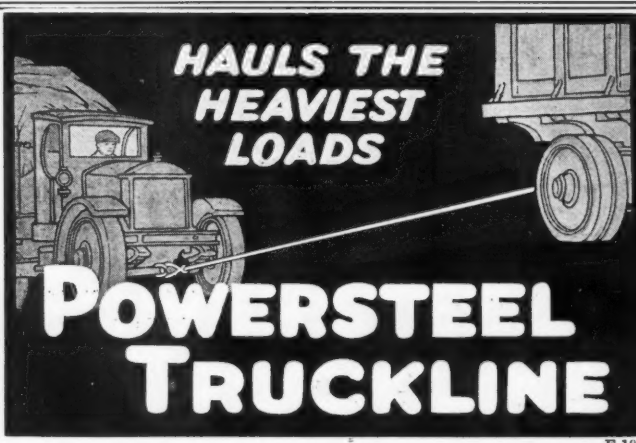


ARE YOU LOOKING FOR A REAL BARGAIN?

Watch the classified advertising columns of MOTOR AGE and you'll see many of them. Often a man has goods for quick disposal and he announces the fact here. Whether or not you are in the market right now for certain things you will find it pays to look over the classified ads every time you receive your copy of the paper. It's a good habit to get into and some day you'll be mighty glad of it.

Get the Habit—

READ THE CLASSIFIED ADS
IN MOTOR AGE



HAULS THE
HEAVIEST
LOADS

POWERSTEEL
TRUCKLINE



Effects of a Cause

The new Waukesha Bus and Truck Motor attains its almost incredible results because it is built to attain them. Likewise, maintain them.

Equipped with Ricardo Cylinder Head.

Write for Full Details

THE WAUKESHA MOTOR COMPANY
Waukesha, Wisconsin

Waukesha
TRADE MARK
BUS and TRUCK MOTORS

PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD

"IF IT'S **PARANITE** IT'S RIGHT"
Quality jobbers handle quality cable—that's **PARANITE**.

Indiana Rubber & Insulated Wire Co.
Factory and General Offices—Jonesboro, Ind.

REBABBITTING

You can be sure of quality work, S A E, specification materials and the right price if you send your connecting rods to a **WATKINS** plant for rebuilding and refuse imitations of

WATKINS SERVICE

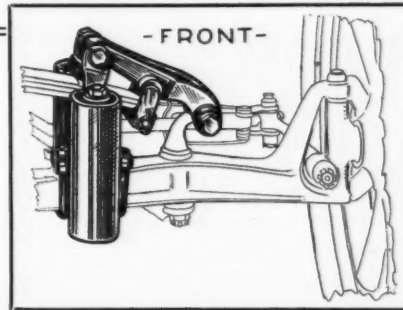
New Bolts and nuts, laminated shims, bronze wrist pin bushings, are part of the rod rebuilding at no extra charge.

Bearing tinned in rod and broached to mirror finish and to standard size cuts time on replacements and holds down labor costs on flat-rate repair jobs. Send your burned-out rods today. All rods shipped same day they are received.



Send Rods to Nearest Factory for Quickest Service

Hartford, Conn., Ripley Motor Service
Indianapolis, Ind., Indiana Watkins Mfg. Co.
Kingston, Ont., Watkins Mfg. Co. of Canada, Ltd.
Los Angeles, Calif., Miller & McIntyre
Memphis, Tenn., J. B. Cook Auto Co.
New York, N. Y., Lake Sales Co.
Omaha, Nebr., Interstate Machinery & Supply Co.
St. Louis, Mo., H. & H. Mach. Co.
Syracuse, N. Y., Watkins Mfg. Co. of New York
Toledo, Ohio, Stewart-Burgan Co.
Washington, D. C., R-L Motive Parts, Inc.
Waterloo, Ia., All States Rebabbitting Service
Wichita, Kans., Home Office—The Watkins Mfg. Co.



QUICK PROFITS FROM VESELY Shock Absorbers

Our offer of refund if the customer is dissatisfied during the first fifteen days is a great closer of sales. During that fifteen days the performance of Vesely shock absorbers makes the buyer so happy he never thinks of asking for his money. He tells his friends, and they come for Veselys.

By a new application of double leverage, Vesely shock absorbers make a Ford ride wonderfully smooth over almost any roughness. They prevent sidesway, hold the body in line, and do not change its hang. There are no alterations in installing. Good profit without trouble!

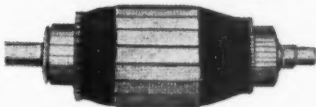
Rich territory still open to live distributors.

J. L. LEHMAN & CO.

Sales Representatives
CEDAR RAPIDS, IA.

ARMATURE REWINDING

We Are
Experts in
The Business



Workmanship
and Service
Guaranteed

1000 SATISFIED CUSTOMERS

Are You One of Them? Save Money by Becoming One.

Fords\$1.50
Generators all others makes.....\$3.25

DO IT NOW—DON'T DELAY

Write for particulars

PIONEER ARMATURE CO., Inc.

2805 Cottage Grove Ave.

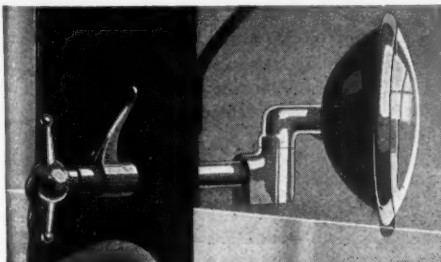
Chicago, Ill.

New Departure Ball Bearings



Only \$10.00 — Looks Like \$50.00 PFAFF SPOTLIGHT Inner Control

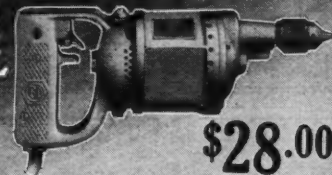
Made throughout of high class materials, with a beautiful finish, Pfaff Spotlight Inner Control looks and is worth lots more than its price. That's why it sells. And the profit is large. Stays put when the lower



windshield is opened. Adjusts to any angle. Easily installed. Requires only a $\frac{3}{8}$ " hole thru corner post. Light can be turned to rear of car so that driver can see to back in or out of garage in the dark. Send for illustrated circulars.

PFAFF MFG. CO.
6340 Stewart Ave.
Chicago, Illinois

BLACK & DECKER QUARTER INCH DRILL



\$28.00

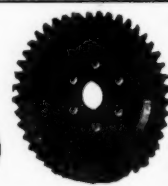
"With the Pistol Grip and Trigger Switch"

THE BLACK & DECKER MFG. CO.
Towson, Md.

JOHNSON Gas Appliances FOR Heat-Treating—Soldering—Metal Melting Do Not Require a Forced Air Blast

Write for our full descriptive catalog

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA



Textolite TIMING GEARS

A General Electric product. Made entirely of cotton fabric processed to wear like iron. Eliminates all noise from the timing gear assembly. For practically all cars. Write for prices.

JOHN C. HOOF & CO.
157 W. Illinois St. Chicago

Have you seen the new Gilmer Fan Belt?

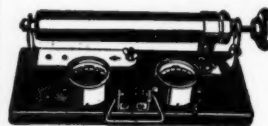
It's a V shaped belt, constructed of tough fabric and a new special rubber compound. Sizes for all popular cars using V or grooved pulleys. Write for prices and complete information.



L. H. Gilmer Co.
Philadelphia

"It's a Gilmer Product—you can depend on it."—Happy Van, the Gilmer man.

Gilmer

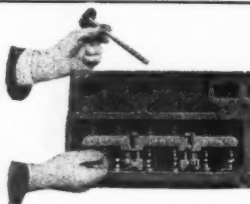


TEST YOUR BATTERIES

by the Chart Method. Something New. Send for free booklet, today.

Allen-Bradley Co.
Electric Controlling Apparatus

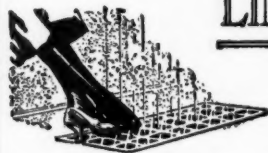
281 Greenfield Ave. Milwaukee, Wis.



SPEED-O Multiple Valve Lifter

LIFTS 8 TO 12 VALVE SPRINGS
IN LESS THAN 30 SECONDS

Manufactured by
SPEED-O MULTIPLE VALVE LIFTER CORP.
1926 Broadway, New York



LINENDOLL EXHAUST HEATER

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.
Norwalk, Ohio



Garage Tools
make well equipped
shops. Ask your
jobber.

Fast and ACCURATE for re-facing, reseating and grinding all size valves.

Sioux Flexible Shaft and Attachments take the tool to the work.

Albertson & Co., Sioux City, Ia.



—the Solution of the
used car problem!

Percy Chamberlain Associates
1320 Book Bldg., Detroit

KISSEL

The Custom Built Car



The Aristocrats of
Motordom

7 Models—Open and Closed
Distributors in principal
cities. Open territory now
being closed.

Kissel Motor Car Co.
Hartford, Wis.



QUICKLIFT Service Jack

A "SAFE" one stroke pry
jack for all light cars. Instant
adjustment—handle won't snap
up and damage car. Made of
steel—priced low. Write for
catalog.

**C. A. Dickerson Compressor
Corp.**
220 Chicago St., Buffalo, N. Y.

The AERMORE Exhaust Horn

"The Signal
with a Smile"



At dealers or direct
THE FULTON CO.
Dept. 15-F, Milwaukee, Wis.

ZENITH CARBURETOR

More
Power
Less
Fuel

Zenith - Detroit Corporation, Detroit, Mich.

"The Best-Equipped Shop
Gets the Business"



THERE are two factors that determine the value of a publication as an advertising medium.

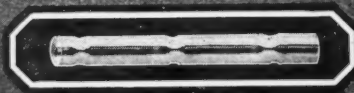
Editorial excellence will indicate its influence with its readers. Membership in the Audit Bureau of Circulations indicates its business ethics and methods.

The first shows whether the paper is worth reading. The second shows how many people read it.

In both the advertiser is vitally interested. MOTOR AGE invites the closest scrutiny. Its A. B. C. report is accessible to advertisers.

KESTER Acid-Core WIRE SOLDER

"REQUIRES
ONLY
HEAT"



SAMPLE
FREE

CHICAGO SOLDER CO. 4201 Wrightwood Ave.
CHICAGO, ILL.

GARDNER

Motor Car

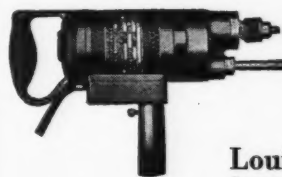


Greatest Load Capacity for size makes Gurney Ball Bearings best for Replacement Work.
Let our Engineers assist you
GURNEY BALL BEARING CO.
Jamestown, N. Y.

GURNEY

18917

Get This "Pioneer" Garage Special



Electric Drill
and Valve Grinder

Greatest time and money saver,
as well as money maker, for
your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated
Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.



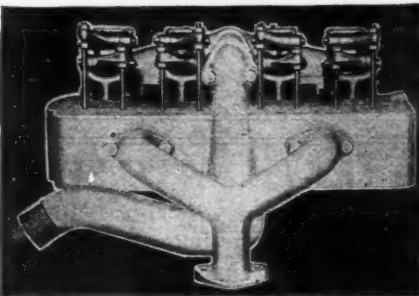
Franklin

The
**Super Single Stage
Air Compressor**

Has no complicated devices, no fancy accessories, no unnecessary parts. Everything strong, durable, with a specially designed compressor having super-cooling spiral cylinder fins. The patented Unloader saves electricity and cuts down repair bills. Standard replacement parts. Order today from your jobber or write for full particulars. \$225 f. o. b. Norristown.

FRANKLIN AIR COMPRESSOR WORKS
2604 Main Street, Norristown, Penna.

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors ROOF 8 VALVE HEAD FOR FORD MOTOR



Stupendous Power—
Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete — ready for installation — no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality — lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us
THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

FOLLETT'S NEW MODEL TIME STAMP

—accounts for every labor minute



Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM

Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic — except for winding. Special machines, with as many as six different words, can be made. Every machine guaranteed.

Learn the interesting details from our descriptive data.

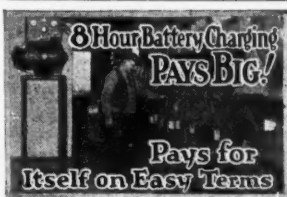
Follett Time Recording Co., 7 West Broadway, New York City



Services of our Engineering Department are at your command at all times on layouts where Angular Contact Radial Bearings or Angular Contact Thrust Bearings are used. Our experience is broad and covers many years. When may we be of service to your organization?

The Bearings Company of America
Lancaster, Penna.

Western Sales Office,
1012 Ford Bldg.,
Detroit, Mich.

**8 Hour Battery Charging
PAYS BIG!**

Pays for
Itself on Easy Terms

Get Your HB Charger NOW!
HB 8 Hour Charging puts your shop ahead of competition. Only \$20 monthly pays for HB 8 Hour Battery Charging. Small cash payment brings HB outfit on 30 days' trial with money-back guarantee. Your profits easily carry \$20 monthly terms with nice surplus besides. HB outfit saves on current, labor, upkeep—handles more business, draws trade. Write today for Bulletin 247.

HOBART BROS. CO.
Box AR 224
Troy, Ohio



140 Combinations —all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.

ACE HIGH-RATE BATTERY TESTER

shows voltage drop
and ampere draw



Inspires Confidence

Shows your customer in a positive way when his battery needs repairs or should be replaced with a new one. In addition to profit it adds to the appearance of your shop and inspires confidence in your ability.

Price \$39.50
F. O. B. CHICAGO

Voltmeter and ammeter, precision type, 4 inch diameter, sapphire jewelled. Variable carbon rheostat —0 to 600 amps.

ORDER FROM YOUR JOBBER

WEIDENHOFF 4359 ROOSEVELT ROAD
CHICAGO, ILL., U. S. A.

Barty Parts Make a Better Axle



—they act as a differential semi-lock which makes your axle essentially a solid axle on straightaways and allows the differential to function at the turns. Simple, easily installed. Get the details.

Barty Axle Corp.
Syracuse, N. Y.

**BARTY
CONTROL
PARTS**

"CONNEAUT" Plastic Metallic Packing

Patented

Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobber—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

The Conneaut Packing Company

Conneaut, Ohio

ALVORD QUALITY TOOLS



Taps, Dies, Cutters, Drills, Reamers
Send for Catalog
ALVORD REAMER & TOOL COMPANY
Millersburg, Pa.



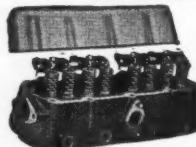
IT'S EASY TO SELL

"The only oil ring with a mileage guarantee"

"Sav-Oil" is stamped on bottom of every ring

The Sav-Oil Ring Mfg. Co.
1037 S. Figueroa St., Los Angeles

FRONTENAC CYLINDER HEADS and FRONTY-FORDS



The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book, "How to Build a Fronty-Ford." \$2.00; free with orders of \$50.00 or more.

CHEVROLET BROS. MFG. CO., 410 W. 10th St., INDIANAPOLIS

Let us send you our FREE Catalogue on

Huetter's Fly-Wheel Gear Bands

Huetter Machine & Tool Co.

546 Kentucky Ave.

Indianapolis, Ind.



Welco Accelerator

Quickly installed on Fords

Works independent of throttle. Adjusting nut sets idling speed. Complete with heel rest, screws and adjusting nut, in attractive carton. Ask your Jobber.

Welco Products include Step Plates, Blanket Holders, Gas Tank Caps.

The Welker-Hoops Mfg. Co., Middletown, Conn.

\$1.50

GRINDING
MACHINES

BORING
MACHINES

LANDIS

LANDIS TOOL COMPANY

WAYNESBORO, PA.

NEW YORK OFFICE:
80 Church St.



Should Be On Every Car
You Sell

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price. Ask your jobber for details. Made for Ford, Dodge, Overland, Chevrolet 490 and Superior, Maxwell, Star and Gray Cars.

The Spencer Mfg. Co.
Spencer Ohio



Wood-I-Mes formerly RED DEVIL

SELF-ALIGNING BURNISHING MACHINE
Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Wood-I-Mes Compound, \$1.50. Write for complete details.

WOOD-IMES MFG. CO., Minneapolis, Minn.
FORMERLY MID-WEST MFG. CO.



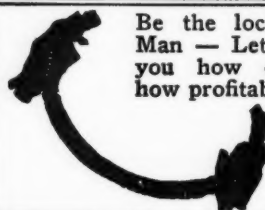
PORTER RED-CUT GLASS

For Ford Replacements



The finest quality hand blown triple strength crystal sheet glass cut to exact size and finished on one edge. Packed in a manner that minimizes breakage. Jobbers and dealers can carry stock with little chance of damage. Write for complete details.

PORTER MIRROR & GLASS CO., Fort Smith, Ark.
Automotive Division—3124 Locust Blvd., St. Louis, Mo.



Be the local Logan Man — Let us show you how easy and how profitable it is to

install Logan Ring Gears.

Kauffman Metal Products Co.
Bellevue, Ohio

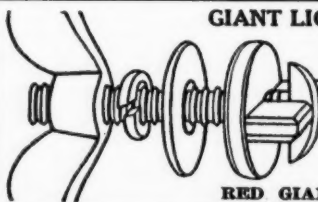
**LOGAN FLY
RING GEARS**



Real High Tension Ignition for Ford Cars

Varley Transformers eliminate nearly all chronic ignition trouble. Save gas. Add power. Keep plugs clean. Stop misfiring. Save repairs. \$2.50 each. Write for full particulars.

The Autocoil Co., Jersey City, N. J.



GIANT LICENSE PLATE HOLDERS

When you lose a license plate the cost is from \$2.50 to \$5.00. With Giant license plate holders you need not fear losing your license plate as they are fastened permanently to the holders and can be installed in one minute's time. Guaranteed to give perfect satisfaction or money refunded. If your jobber cannot supply you, write us direct.

List price 90c for four.

RED GIANT TOOL CORP., Lynchburg, Va.

Thirty-seven
BRANCHES
AHLBERG BEARING COMPANY
321 EAST TWENTY-NINTH STREET, CHICAGO ILLINOIS



"Good for Twenty Years at Hard Labor"
BRUNNER MFG. CO., UTICA, N. Y.

GATES VULCO

Fan Belts and Radiator Hose

"Leaders in the Industry"



EVERYDAY PISTON RINGS

Patented Non-leakable joint. Quick seating and self-adjusting to cylinder wear.

Write for particulars

ROYAL PISTON RING CO., Inc.

Bath, N. Y.

Biflex
for every car

Cushion
Bumper



"PROTECTION
WITH DISTINCTION"

THE BIFLEX CORPORATION, Waukegan, Ill.



THREE PRODUCTS YOU NEED
ZIP FRICTION PASTE, for fitting in bearings.
ZIP GRINDING COMPOUND, for valves.
ZIP LAPPING COMPOUND, for lapping in pistons.

The Original
Water Mixed.
U. S. Pat. 1353197

Write For Samples
THE ZIP ABRASIVE COMPANY

Ask Your Jobber.
Cleveland, O.
Denver, Col.

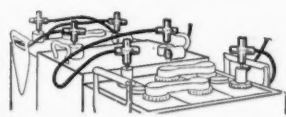
flatlite



A reflector—not a lens. Greatest dealer opportunity ever offered. Sold either as complete headlamp or simply as a reflector to be inserted in lamps now in use. Write.

THE AMERICAN FLATLITE CO., Cincinnati, Ohio

SHURO BATTERY CONNECTORS



A tap with a hammer anchors them into battery terminal—like a nail in a block of wood. Positive metal-to-metal contact. Built to last for years.

BURTON-ROGERS CO.
26 Brighton Ave., Boston



\$50
110 VOLT

PETERSEN
Guaranteed HALF INCH
ELECTRIC DRILL

So powerful that the combined strength of three men could not "stall" it when drilling $\frac{1}{2}$ " holes in steel. Write for miniature catalog describing the complete line of Petersen Portable Electric Tools.

A. H. PETERSEN MFG. CO., 1818-24 Fremont, MILWAUKEE

HIGHER
PRODUCTION
GREATER
SAFETY
BIGGER
PROFITS

WRIGHT

MANUFACTURING
COMPANY
LISBON, OHIO

HIGH SPEED HOIST

"It pays to buy a Kellogg"

KELLOGG

COMPRESSORS

Rochester, New York



Kellogg

BRAKE LININGS and CLUTCH FACINGS

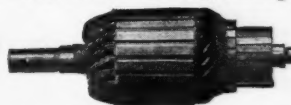
Always used where safety and service are the first and only consideration.

KELSO M'FG CO.,

TRENTON, N. J.

Send Us Your Armature Repair Work

FORD
ARMATURES
REWOUND
\$2.00



MOST ANY
TWO UNIT
GENERATOR
ARMATURE
\$5.00

ALL WORK GUARANTEED—WRITE FOR PRICE LIST
U. S. AUTO SUPPLY CO., 3845-49 S. WABASH AVE., CHICAGO

BOWSER

ESTABLISHED 1885

ACCURATE MEASURING PUMPS

S. F. Bowser & Co., Inc.

Home Plant, Fort Wayne, Indiana



Beveled Edge
with Oil Groove

UNIVERSAL

2 rings that cover
every need

Ground or turned finish
Attractive jobber's proposition

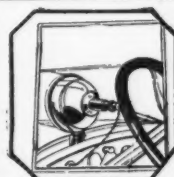
UNIVERSAL MACHINE CO.
BALTIMORE, MD.

DUSENBERG

The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes

INDIANAPOLIS

U. S. A.



INSHIELD DRIVING LIGHTS

INSIDE THE WINDSHIELD—NO GLASS TO CUT

INSHIELD \$
4 1/2 in. diameter. Heavy
Nickel or Black Enamel.
Made of heavy sheet brass.
21 c. p. Masda precision
type tipless bulb, silver,
triple-plated reflector \$7.50

INSHIELD SENIOR
5 1/2 in. diameter. Nickel
finish only. Simplest and
best inner-controlled driv-
ing light made.

\$18.00

The Inshield Products Co., Toledo, Ohio
Formerly the Thal & Bitter Machine Co.

Patented Oct. 30, 1923

REG. U.S. PAT. OFF.

TESTBESTOS

AUTOMOBILE
BRAKE LINING

AMERICAN ASBESTOS CO., NORRISTOWN, PA.



GAYLORD LITTLE GIANT Water Saver

Cuts your water bills in half by stopping water waste. Screws on end of hose. Gripping the nozzle starts the flow. When nozzle is released, the water stops AUTOMATICALLY. Self-operating. Impossible to get out of order. Made of brass; hose nozzle of pure rubber. List price \$3.00.

THE GAYLORD MFG. CO. Paterson, N. J.



KING QUALITY

ALL THE NAME IMPLIES

STEERING KNUCKLE BOLTS AND BUSHINGS
PISTON PINS, PISTON PIN SET SCREWS

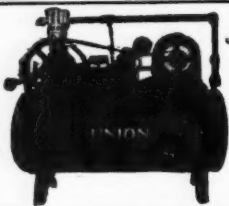
Automotive Division

KING SEWING MACHINE CO.
BUFFALO, N.Y. BRIDGEBURG, ONT., CAN.

Built For Long Life

In filling tires be sure to get the details of this Model 150 Union Air Compressor of 2 cylinders. Capacity 5 cu. ft. per minute.

Union Equipment Co.
Butler, Pa.



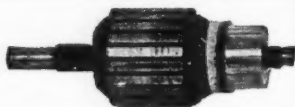
DON'T

Turn Down a Rewind Job
Send it to us. We are "Armature Winding Specialists."

Profit for you in our service—Ford generator armature rewind—\$1.95. Other prices in proportion. All work guaranteed. Write for catalog and prices on all generators.

H. M. FREDERICKS CO.,

Lock Haven, Pa.



CABLES of Quality

The Packard

Standard since the beginning
of the industry.

Electric Company

WARREN,
OHIO



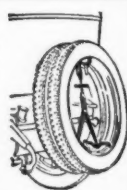
\$700 Profit in One Month

That's what one distributor made. He's only one of many doing a big business. Dealers, too, are making sales by the dozens. Few accessories in recent years have been as popular as the

DUPLIX

Second Spare Tire Carrier & Rim Tool
Carries spare tire—also expands and contracts rim when changing tires. Two tools for the price of one. Write for details.

TRIPP-SECORD & CO.
606 Kerr Bldg., Detroit, Mich.



TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

Pat'd 7-22-'22

ADJUSTABLE BEARING CO., Inc.
Dept. M. Brazil, Indiana

GENERAL ASBESTOS & RUBBER COMPANY



GARCO ASBESTOS PRODUCTS

New York
Main Office and Factories: Charleston, S. C.
Branches
Chicago
Pittsburgh



Take a Tip From Buick

AFTER testing for 8 months under actual service, Buick engineers have recommended the HALL CYLINDER HONE for use in all their branches.

Your jobber will supply you.

THE HALL CYLINDER HONE CO.,
435 Dorr St., Toledo, Ohio



FOLBERTH Automatic WINDSHIELD CLEANER

"It Cleans
While
You Drive"

A good profit for you in this wonderful, fast-selling necessity.

Ask your jobber or write.

THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND

McQUAY-NORRIS

PISTON RINGS
PISTONS
PINS
BEARINGS

McQUAY-NORRIS MFG. CO., ST. LOUIS—CONNERSVILLE—INDIANAPOLIS



UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.



Six design and style bumpers from which to make selection for all popular make cars

Write for details.

THE BELLEVUE MFG. CO.
Bellevue, Ohio



JACOBS CHUCKS ARE STANDARD EQUIPMENT ON THE BEST PORTABLE DRILLS.

Write for circular, "A Jacobs Chuck for Every Purpose."

The Jacobs Manufacturing Co.

Hartford

Conn.

BATTERY SERVICE EQUIPMENT!

UNITRON
Rectifier

PORTOSTAT
Test Set

FOREST ELECTRIC COMPANY

New and Wilsey Streets

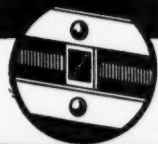
NEWARK, N. J.



WEAVER GARAGE AND SHOP EQUIPMENT

WEAVER MANUFACTURING
COMPANY
SPRINGFIELD
ILLINOIS
U.S.A.

Send for Catalog



HALLADAY Bumpers

"Full Doubleface"; "Doubleface" and "Singleface"—the complete line that ties up least money and still meets every demand. Write for literature, prices, discounts.

L. P. Halladay Co., Decatur, Ill., U. S. A.

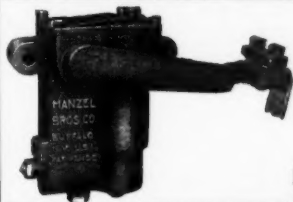
for ALL TYPES of CARS



Goodrich Cable is sold in lengths found to be the most popular with the average buyer—coils of 100 ft. packed in individual cartons. Both shop men and car owners like the clean 100 ft. package idea—and this leads to quick and profitable sales.

Send for samples, prices and discounts.

THE GOODRICH-LENHART MFG. CO., Hamburg, Pa.



MANZEL HYDRAULIC Shock Absorbers

Absorb all road shocks—quickly and smoothly on a cushion of oil. Easily installed on all makes of cars.

Write for Distributor's Proposition

MANZEL BROTHERS COMPANY
306 Babcock St. Buffalo, N. Y.

NEVER-LEAK

CYLINDER HEAD GASKETS

Heat-proof Gas-proof Can't blow out Retain their life
Oil-proof Water-proof Last longer Keep customers sold
One for every standard make of car, truck and tractor.

The Fitzgerald Mfg. Co., Torrington, Conn.

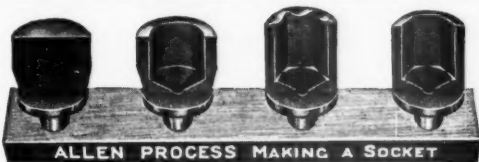
THE QUINCY SILENT AIR-MASTER

The Most Air Per Dollar Cost

WALL PUMP & COMPRESSOR CO.

Quincy, Ill., U. S. A.

Cold-Drawn Sockets



ALLEN Wrench Sets

ALLEN PROCESS MAKING A SOCKET

The Allen Manufacturing Company, Hartford, Conn.



HEAT-SHAPED

PISTON RINGS

Exert an equal pressure on the cylinder wall at every point of its circumference

Write for particulars

Wilkening Mfg. Co.

613 N. 15th St.
Philadelphia, Pa.



Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.
Valvo, an electric-drive bench grinder for valves, valve-seat reamers \$175. See page ads this paper.

Van Norman Machine Tool Co.
Springfield, Mass.

STUTZ SIX—It's a Great Car



STUTZ Speedway Four

America's Pre-eminent Sport Car

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Ind.
Builders of the Original and Genuine Stutz Motor Cars

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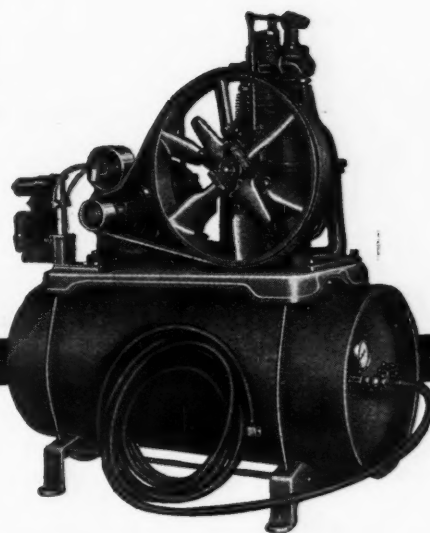
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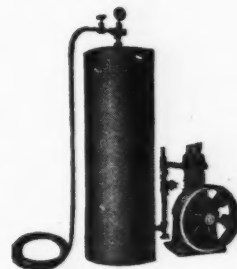


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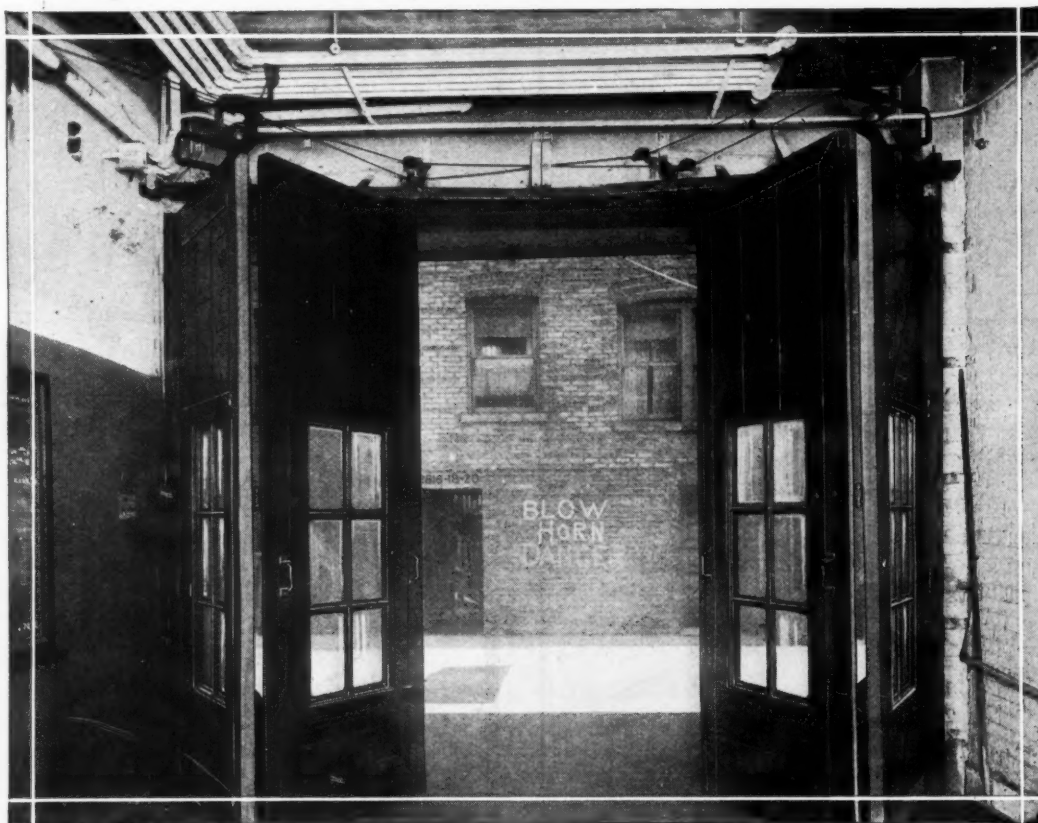
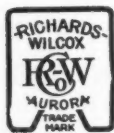
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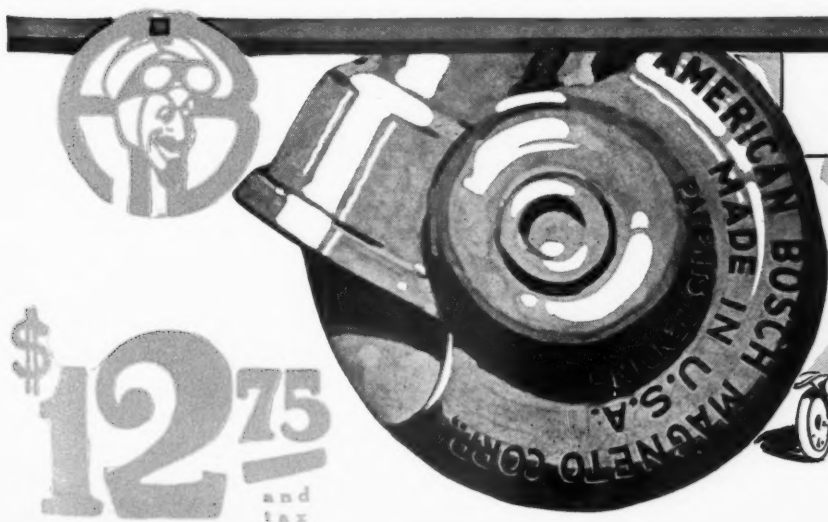
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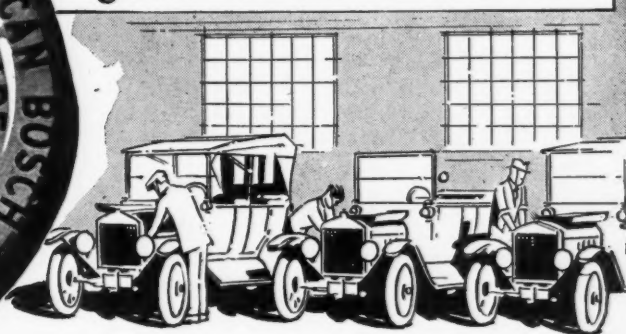
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